

COMPUTERWORLD

Mac user loyalties under stress

By James Daly

How could a company with brilliant engineers, wonderful technology and a fiercely loyal following make such a mess of things?

That's the question fans of Apple Computer, Inc. technology were asking last week as Chairman John Sculley packed his bags and left Apple in the throes of perhaps the biggest technological and spiritual crisis in its 17-year history.

Although Sculley left Apple in a state of disrepair — its earnings down, stock under water, top executives departing and the Macintosh an increasingly tough sell against the DOS/Win-

Losing battle

Users say Apple's trademark ease-of-use distinction is giving way to low-cost Windows-based PCs

LOST DISTINCTION

53%	Yes
20%	Somewhat
26%	No
1%	Don't know

(Response base: 124 Macintosh users surveyed in August 1993)

Source: Computerworld Database Division

dows juggernaut — corporate information systems managers who embraced Apple technology still display a brand loyalty that rivals that of Harley-Davidson enthusiasts.

Hanging tough

In a random survey of nearly two dozen corporate sites last week, none said they planned to leave the Macintosh.

"I've never met anyone who went from a PC to a Mac and then switched back. It only happens at gunpoint," said Valerie Tokumoto, who helps manage more than 1,800 Macintoshes as a member of the technical staff at The Aerospace Corp.

Mac users, page 6

CA to reveal plan to manage mixed nets

Unicenter goes client/server; OS/2 first port

By Thomas Hoffman

Computer Associates International, Inc. this week will disclose plans to deliver client/server versions of its CA-Unicenter systems management software for administering distributed platforms across a network.

CA's client/server systems management strategy is twofold. The company is developing client/serv-

made in Chicago at CA's Systems Software Conference.

Although users said they were excited about CA's heady plans, a few prospective customers voiced skepticism over the vendor's ability to deliver one-stop systems management tools, given the technical hurdles CA will face in making Unicenter work across multiple operating systems.

For example, CA may have to develop a set of application program-

ming interfaces to enable an OS/2-based client running Unicenter to manage an HP/UX server environment, said John Donovan, a senior analyst at Work-Group Technologies, Inc. in Hampton, N.H. CA officials declined to comment on the strategy.

CA's Unicenter has evolved from its mainframe roots to embrace open systems. For example, CA has already delivered a version of CA-Unicenter for HP/UX Unix [CW, Aug. 9]. Versions for Sun and other Unix platforms will soon enter beta testing.

CA, page 15

"If we can centralize a lot of those management functions... that would be a big help."

—Gary Graham, Home Oil Co.

The Islandia, N.Y., software giant is also building an OS/2-based Unicenter product that will enable users to manage multiple heterogeneous systems across a network from a single workstation, according to users and analysts who have been briefed by CA.

The announcements will be

Customer support

IBM blends services to strengthen sales

By Johanna Ambrosio and Thomas Hoffman

IBM consolidated its services under one virtual roof last week, a move that may finally put some muscle behind the company's longtime goal to derive more of its revenue from non-hardware businesses, observers said.

The new services group will also help the company get closer to its customers. It will, for example, provide IBM's sales force with even

more industry-specific knowledge about customers' businesses, sources close to the company said. As such, the restructuring could help resolve long-standing complaints from many shops that IBM salespeople have lost touch with their needs.

The move more tightly connects IBM's outsourcing, consulting, technical, educational and other related functions for the North Amer-

IBM, page 8

As top PC makers regain edge, cloners lose, price wars wane

By Michael Fitzgerald

Compaq Computer Corp. and IBM PC Co.'s continuing gains against clone makers have users wondering if the steep price drops of the past two years will soon be a distant memory — like some of the smaller vendors that helped drive down tags.

Analysts project that the Top 10 PC makers will boost their share by 7% (see chart) to 11% this year at the expense of smaller vendors.

Shifting balance

The Top 10 PC hardware vendors, including IBM, Apple and Compaq, are gaining market share on the rest of the pack



Source: Computer Intelligence/InfoCorp, Santa Clara, Calif.

The resulting consolidation, analysts and vendors predict, could mean a return to the days of orderly price decreases based on component pricing, rather than the bloody battles that have characterized much of the 1990s.

"Smaller vendors simply aren't making money, and they can't use price as an attack weapon the way they used to," said Richard Zwetckhenbaum, an analyst at International Data Corp. in Framingham, Mass. IDC projects an 11% gain for the Top 10 PC makers this year.

Meanwhile, the big players' results — fueled by aggressive cost-cutting and more innovative products — are booming. Com-

PC makers, page 16

Management

CIOs tune in to interactive TV

Information systems executive Roy Prater is a man in a hurry. Prater and other IS chiefs at the nation's media and communications companies are in a feverish high-stakes race to install the techno-infrastructure that will turn the grand visions of interactive TV services into a reality.

Interactive TV, page 102



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NEWS

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- Microsoft will formally announce MS-DOS 6.2 this week as a features upgrade. *Page 4*
- Novell answers new MS-DOS with Novell DOS 7.0. It also works to improve peer networking for corporate users. *Page 4*
- John Sculley's new company could provide spark to jump-start Newton. *Page 6*
- National Semiconductor moves into network adapter and hub market. *Page 10*
- Novell's NetWare/IP NetWare Loadable Module ships this week, ending need to choose between NetWare and TCP/IP. *Page 10*
- Microsoft pursues three-pronged strategy for managing object-driven suites. *Page 12*
- IBM puts a good face on third-party sales of APPN and makes major additions to Networking Systems product line. *Page 14*
- HP and Cabletron both announce additions to their enterprise network management systems that promise easier, single-console management. *Page 14*

DESKTOP COMPUTING

- Intel fixes bugs in Peripheral Component Interconnect, and it battles fears that it will make the standard proprietary. *Page 45*

WORKGROUP COMPUTING

- Mainframe-oriented database and application development skills can't carry you in a client/server environment. *Page 53*



ENTERPRISE NETWORKING

- ATM seems likely to survive as a long-term networking option. *Page 71*



In Depth: Steve Jobs and Bill Gates have a lot in common, but that doesn't mean they have to be nice to each other. *Page 109*

LARGE SYSTEMS

- Digital modulates concentration on Alpha to "remember the VAX." *Page 87*

APPLICATION DEVELOPMENT

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MANAGEMENT

- Those headline-making media and communication firm deals won't amount to much unless industry IS execs can supply the infrastructure for interactive television services. *Page 102*

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CAREERS

- Moving into management brings big changes. *Page 114*

MARKETPLACE

- Fewer customers take open systems claims on faith. Informal testing and use of compatibility test labs grow. *Page 121*

COMPUTER INDUSTRY

- Merger of Horizon Strategies and Momentum Software creates broad-based supplier of message-oriented middleware. *Page 133*

COMMENTARY

- CPU and storage requirements are shrinking fast and that's going to change your job, says Charles Babcock. *Page 6*
- John Sculley is an easy target, writes Bill Laberis, but we ought to remember the good he did at Apple. *Page 40*



- Response mode doesn't work. You can't afford to wait for customer requests, says Dennis Jones of Federal Express. *Page 41*

- Giving customers too much information can be bad for business, writes Max Hopper. *Page 41*

- Software suites are pushing out best-of-breed applications, says David Coursey, not necessarily a positive development. *Page 45*

- Internet discussion groups are deep veins of practical information, and Mary Cronin explains how to mine them. *Page 71*

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Executive Briefing

Skill fragmentation is a major challenge for companies attempting to implement client/server. The typical method of attacking projects is to stitch together teams consisting of specialists in various areas — LANs, PCs and mainframe databases. **Working this way just doesn't cut it**, say those who have tried. Some reasonable means has to be found to train IS staff in all disciplines and across platforms. *Page 53*

Some of the comforts of host-based systems are finding their way into the client/server environment. CA plans to deliver client/server versions of its CA-Unicenter systems management package for a variety of distributed operating systems over the next six months. *Page 1* This week,

Unisys will release a port to Windows of its OpenMapper application development environment. *Page 88* Several providers of departmental peer-to-peer networks are claiming to offer sophisticated centralized network management, user administration and security features. *Page 4*

Progress in network integration: At many sites, network management requires multiple terminals and staffs. New developments hint that the need for such redundancy will be short-term. HP promises that, by early 1994, network managers will be able to control TCP/IP and SNA networks from one OpenView management station. Cabletron plans a version of its network management software that will allow other management apps to run its hardware. And IBM enhances its Networking Systems product line to help SNA shops moving into distributed computing retain network coherence. *Page 14*

Windows made easier? Software developed by Xerox's XSoft division, from research at Xerox

PARC, reportedly makes Windows easier to use, enclosing it within the metaphor of a student's notebook. Compaq has exclusive rights to the interface for a year and will include it with its next model release. *Page 16*

In the tip of the iceberg category are a couple of alliances, which experts say are the beginnings of trends: A Lotus pact with Gupta will add Notes support to Gupta's line of client/server development tools. This collaboration may be the first of many with RDBMS makers. *Page 20* Another is the merger of some small, privately held suppliers of message-oriented middleware. Many mergers and buyouts are expected in this area as companies attempt to stock up on integration talent. *Page 133*



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Novell ups ante in peer LANs

By Elisabeth Horwitt
SAN JOSE, CALIF.

■ Novell, Inc. last week released Personal NetWare to go head-to-head with Microsoft Corp.'s Windows for Workgroups 3.11 in the corporate peer networking market.

The preceding generation of peer networking products essentially provided low-end file- and print-sharing services for small businesses that did not want the cost or technical trauma of setting up a true network operating system in a client/server environment.

While still serving small businesses, Personal NetWare, Windows for Workgroups 3.11 and Artisoft Corp.'s LANtastic 5.0 (see chart) also offer corporations an entry-level peer networking system for small sites that can hook into a full-scale client/server network whenever users are ready. The latest versions of all three products provide the centralized network management, user administration and security features that information systems managers have been demanding, the vendors said.

Transamerica Financial Services is thinking of implementing Personal NetWare to allow a few users to share hard disk space, according to Cheryl Grossman, senior technical analyst at the Los Angeles firm.

A major advantage that Personal NetWare has over the previous version, NetWare Lite, is the Universal NetWare Client, which allows users to do peer-to-peer and NetWare client access with the same protocol stack, said Ken Diliberto, network systems specialist for the city of Fresno, Calif. NetWare Lite had its own client protocol.

Still working

While Windows for Workgroups 3.11 supports Novell's IPX transport protocol, Microsoft is still negotiating with its rival for the right to implement the NetWare client requester on Windows for Workgroups and Windows NT. Without the requester, Windows NT and Windows for Workgroups clients can access an application, such as SQL Server, on NetWare, but not file or print services, a Microsoft spokesman said.

Both Novell and Microsoft are bundling their peer networking products into their respective desktop platform. Microsoft is positioning Windows for Workgroups as a much more network-capable Windows, and Novell is incorporating Personal NetWare into the soon-to-ship Novell DOS 7.0.

Priced at \$99 for a single-user version bundled into DOS 7.0 (see story at right), Personal NetWare is a cheap way to get users started on NetWare, said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington-based consulting firm. In contrast, Windows for Workgroups 3.11 is priced at \$219.95 for DOS users.

Among the new features that Personal NetWare offers are the following:

- Software that allows any Simple Network Management Protocol-based system to monitor disk and operating system configuration and resource utilization on Personal NetWare PCs. Users with no central management system can configure one Windows workstation as a management console.
- A "replicated directory" enables desktops to keep current on resources residing on other Personal NetWare systems.
- Password security at the machine, file and directory level.

Peer networking comes of age				
	SERVER SUPPORT	NETWORK MANAGEMENT	SECURITY	PRICE
Windows for Workgroups 3.11 (available early November)	NT, Vines (via NetBEUI) NetWare (via IPX)	Yes (via Hermes)	Network level; centralized administration	\$219.95 for DOS users; \$69.95 add-on for Windows 3.1
Personal NetWare (available by year's end)	NetWare	Yes (via SNMP)	Machine, file and directory level	\$99 per single user; bundled with Novell DOS 7.0 (\$69)
LANtastic 5.0 (available since March)	NetWare	To come (via VisiSoft)	File level; centralized administration	\$119 per node for adapter-independent version, DOS only; \$139 for Windows

'Ferengi' arrival raises pricing questions

By Ed Scannell

While IBM's Personal Software Products group may lose some sales of OS/2 2.1 to a version with built-in Windows emulation that is expected to ship next month, the gamble may prove worthwhile if the product attracts enough DOS and Windows users.

Code-named Ferengi, the alternate version allows Windows and DOS users to seamlessly layer OS/2 2.1 functionality on top of their existing operating system software for an introductory price of about \$50, sources said [CW, Oct. 18]. Conversely, the current version of OS/2 2.1 has built-in support for DOS, Windows and OS/2-compatible applications based largely on source code licensed from Microsoft Corp.

Users can today buy a new version of OS/2 2.1 for \$150 or a version that allows them to upgrade to OS/2 2.1 for \$120. Ferengi's \$50 promotional price tag could stall some of those sales, which have shown a sharp upturn in the last

month or two [CW, Oct. 18].

IBM plans to raise the price on Ferengi early next year to where "it would be more in line with the current pricing on OS/2 2.1," sources close to IBM said. But its price would still be less than that of OS/2.1.

"We really don't see this [Ferengi] eating into our present sales as much as we see it expanding our chances in the Windows market," said one IBM executive who requested anonymity.

Timing is right

IBM believes it has accomplished its goal of converting over the majority of OS/2 2.0 users to Version 2.1, and that the timing is right to turn its attention to the much bigger opportunity the Windows market represents. "There is a huge base of Windows users to whom we can offer the chance to run their applications faster and more reliably," the executive said.

In interviews last week, information systems organizations using both OS/2 and Windows said

they are at least interested in examining the options Ferengi gives them. They see the product as a cheap way of keeping up with their users' Windows applications demands while preserving their systems configurations.

"My users are always saying that there is an application they need but it only runs under Windows. I think IBM can solve that problem for me [with Ferengi]," said Deems Davis, vice president of IS at Fireman's Fund Insurance Co. in San Francisco.

Fireman's Fund has about 2,700 desktop users of OS/2 with about 100 who use Windows.

Some IS executives with Windows-based shops who are evaluating Windows NT said they do not believe a product like Ferengi offers a compelling reason to switch.

"What IBM is selling Windows users is this great [crash] protection. But if you properly tune Windows, there are few problems," said Mike Drips, a consultant and beta user of both Windows and OS/2 in Tampa, Fla.

Dueling DOS

Trying to take the edge off Microsoft's MS-DOS 6.2 (see story below) and Windows for Workgroups 3.11 initiatives, Novell will next month unveil Novell DOS 7.0 integrated with Personal NetWare.

Version 7.0 will feature preemptive multitasking capabilities that let users run multiple DOS applications in protected mode. Unlike Windows 3.1, when users multitask multiple DOS applications, they can see only one application on screen at a time. Applications that are not running under Novell DOS 7.0 on screen will continue to execute unseen in the background, said John Linney, product line manager for Novell DOS 7.0.

Novell has also developed a DOS Protected Mode Services application programming interface designed to relieve users of the problem of memory constraint.

The product also comes with Stac Electronics, Inc. Stacker 3.1 program, which lets users send data across networks and from drives that are compressed or uncompressed.

Novell DOS 7.0 supports Windows 386 Enhanced Mode, which means it is compatible with the soon-to-be-released Windows for Workgroups 3.11, Linney said.

Novell said the product initially will carry a \$99 price tag.

—Ed Scannell

DOS upgrades MS-DOS 6.2 won't be a bug fix

By Ed Scannell

Microsoft Corp. this week will formally announce MS-DOS 6.2, featuring several improvements to Version 6.0's compression utility, a SmartDrive caching utility and a new utility that repairs hard disks.

Sources said company officials will make a point of saying the release is a features upgrade and not a bug fix to correct problems concerning its DoubleSpace compression utility and SmartDrive, which some users said caused them to lose data earlier this year.

Because it is a features upgrade, Microsoft will charge users for the program. While final pricing has not been set, sources close to the company said the cost will be "at least as aggressive" as it was for MS-DOS 6.0, which was slightly under \$20.

Some of the new improvements to DoubleSpace include DoubleGuard, which protects data against corruption by verifying data integrity before writing to disk, and the ability to uncompress any DoubleSpace drive or completely uninstall the product.

The new ScanDisk utility is able to detect and repair disk errors on both uncompressed and DoubleSpace drives.

Microsoft has changed SmartDrive so it now loads as a read-only cache by default. If users enable write-caching, MS-DOS will not display the command prompt until SmartDrive has written its cache to disk. This prevents users from turning off their systems before data in memory has been saved.

Gentlemen, start your snails.

PC Magazine independently defined and ran a battery of real world performance tests to compare database server software. PC Magazine states, "Oracle7 was the hands down winner on our performance tests, outperforming the others by a wide margin."

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PC Magazine

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154 min.

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154 min.

SYBASE

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PC Magazine

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SYBASE

660 sec.

IBM DB/2

698 sec.

INFORMIX

759 sec.

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"Oracle7's read-consistent model and record level locking helped it breeze through the test."

PC Magazine

ORACLE7 ■ 47 seconds

IBM DB/2

636 sec.

SYBASE

657 sec.

INFORMIX

759 sec.

CONCURRENT RANDOM WRITE

"Even with the many new features that were added, we found Oracle7 to be exceptionally stable"

PC Magazine

Just to be fair, here's what PC Magazine had to say about the other guys:

Informix OnLine "Only after days and days of repeated crashes were we able to obtain a full set of results."

Ingres Server "...we would not recommend it because of the showstopping multi-user bug we encountered."

Gupta SQLBase "...took an unthinkable 60 hours to load the tables and then crashed on the index builds..."

For your copy of the complete PC Magazine article, including test results call 1-800-633-1071 Ext. 8129.

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For 30 years, makers of computers and their peripheral devices have consistently packed more and more power into smaller packages. Many people assume we have moved so far down the path to miniaturization that few gains remain to be found. Far from being played out, however, this downsizing trend is accelerating.

Ralph Merkle, a Xerox PARC researcher in Palo Alto, Calif., says the mainframe of the first or second decade in the 21st century will be the size of a sugar cube and will execute more instructions per second than today's Cray supercomputers.

This means that the glass house, which hosts water-cooled mainframes and volumes of refrigerator-size disk drives, will shrink to something closer to the size of a birdhouse. Closets that used to combine network hardware and wiring will soon be all that's needed for both the network and the computer room.

The smaller devices that result will require less power to run and will take up less space. By the year 2000, the largest piece of the PC is likely to be the end-user interface, whether it is a keyboard, notepad or microphone.

In the 1960s, computer memory consisted of tiny iron cores, or doughnuts, strung by hand, each ring representing a bit. The move to magnetic media allowed memory to expand geometrically and keep expanding at a rate of 30% a year. There have been many predictions this rate would soon reach its physical limit, but instead it has increased to 60% a year in the last two years, a rate

analysts say can continue at least through the end of the century.

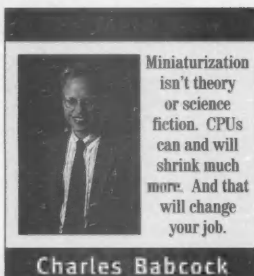
The computer on a chip popularized by the Intel 8088 10 years ago was fabricated with circuits three microns wide. Intel's Pentium is a 0.8 micron design; the PowerPC is a 0.65 micron design; and IBM/Siemens recently shipped 64M-bit DRAMs fabricated at the 0.35 micron level. Everyone knows there is some physical limit to how far lithographic etching can take the chipmaking process, but we also know it hasn't been reached yet. And when it is, it is expected to be supplanted by circuit-building techniques that take us down to the submicron level of a few molecules.

The industry already approaches the molecular level in a few instances. Giant magnetoresistance, which will lead to new capacity levels in magnetic disk drives, does not exist in large, bulky materials. It can be prompted to manifest itself when nickel-iron slivers two nanometers thick are separated by a four-nanometer sliver of silver. Upon exposure to a tiny magnetic field, the metal sandwich registers a large change in electrical resistance. The nickel-iron layer is equivalent to about eight layers of molecules. It would take 500,000 of these layers to equal the thickness of a sheet of typing paper.

IS directors can assume, then, that footprints will continue to shrink over the next two decades at a pace similar to the one experienced in the last two. And once the industry finds itself producing components whose working parts are a few molecules thick, authorities like Merkle and Eric Drexler, authors of the 1992 book *Nanosystems*, believe its manufacturing processes will jump to the molecular and atomic level.

Circuits will be laid down molecule by molecule—or more likely spawned in chemical processes that prompt molecules to gather in a preordained path. Drexler predicts a storage device will be available in five to 10 years in which a single molecule stores a bit.

Low-cost, highly compact computing power will make the computer a universal tool throughout the organization of the future. Mobile computing will cease to be different from any other form. Instead of managing machines, the IS staff will focus on the data itself, trying to maintain some measure of control in the face of a ubiquitous flow of information.



Charles Babcock

Miniaturization isn't theory or science fiction. CPUs can and will shrink much more. And that will change your job.

Babcock is *Computerworld's* technical editor. His MCI Mail address is 575-2737.

Mac user loyalties under stress

CONTINUED FROM PAGE 1

located in El Segundo, Calif.

Just because users aren't going to budge doesn't mean they don't have complaints... or two cents worth of advice for Apple. They have plenty.

A chief concern is that Apple has its head in the clouds, dreaming of pocket-size Newtons and a trillion-dollar marketplace where the electronic and entertainment worlds meet. That vision diluted its ability to provide goods for the corporate environment.

Other gripes concern weak support and a crowded product line with little clear differentiation among models. "I think Apple is overestimating our ability to change and upgrade constantly. We just can't afford the hassle," said Fred Morsheimer, director of MIS at Trader Joe's Co., a specialty food retailer in South Pasadena, Calif.

"Right now, Apple is going in way too many directions at once," said Eric Joa, manager of IS at BC Hydro in Burnaby, British Columbia.

Last week's announcement of a gaggle of new Macintoshes is supposed to make Apple's machines more price/performance competitive

with comparable Intel Corp.-based computers and also satiate users awaiting the arrival of PowerPC machines. Several of the new models can be upgraded to the PowerPC chip.

"Whenever Apple gives you more bang for the buck it knocks off another argument against the Mac," said Tim Yancy, a unit manager at Southern California Edison Co. "Plus

we can't wait a year to buy new machines. So having them upgradable to the PowerPC kills two birds with one stone."

Conversion needed

However, topping the list of tough tasks ahead for Apple is persuading users to shift to the PowerPC architecture (see story page 46).

In January, Apple is expected to announce several models based on the PowerPC 601 chip, which is a collaborative effort among Apple, IBM and Motorola, Inc.

More PowerPC-based systems are expected to ship by March and eventually all Macintoshes will run on the chip, Apple officials said.

The momentous announcements have generated a nail-biting uncertainty among IS managers. "It's the traditional legacy question. How are we going to tie it into what we have

Continued on page 7



Sculley move could boost Newton

By James Daly and Joanie M. Wexler

John Sculley's move from the top spot at Apple Computer, Inc. to a relatively unknown telecommunications company could ironically prove to be the jump-start needed to drive sales of the Newton personal digital assistant, his last sweetheart project at Apple.

Last week, Sculley became chairman and chief executive officer of Spectrum Information Technologies, Inc., a wireless technology pioneer that holds a patent on technology to allow portable computers to transmit data via cellular telephone networks.

The user mobility created by wireless networks is crucial to the adoption of machines such as the handheld Newton, a project that Sculley promoted heavily during his last 18 months at Apple.

Building blocks

Spectrum, a \$100 million company that lost \$9.8 million in its last fiscal year, develops chips and software that enable the construction of a widespread wireless network infrastructure, said Vice Chairman Peter Caserta, who relinquished the chairmanship to Sculley.

Spectrum's main business is licensing its Accell interface, which connects to a laptop computer housing any Hayes-compatible modem and then plugs into a cellular telephone. In its next iteration, Accell's underlying technology, Direct Connect, will emerge in the form of chips licensed to laptop vendors that will fit right into the computer, according to a Spectrum spokesman.

Spectrum has licensed Accell/Direct Connect to AT&T and more recently inked licensing pacts bearing codevelopment and marketing ramifications with IBM and Rockwell International, Inc. (see brief page 83).

Sculley spent much of the past two years at Apple cutting similar deals, taking criticism for diverting Apple's energies away from meeting the needs of the business market.

Sculley's arrival at Spectrum startled many analysts who expected him to wind up with a much larger firm. But one Apple insider said the move makes sense because Sculley always considered himself a builder.

Originally, Sculley was brought in to help build Apple into a world-class company. He did so, raising it from a \$600 million firm to an \$8 billion one.

Facts and figures
Spectrum Technologies, Inc. Manhasset, N.Y.
BUSINESS
Maker of a connection device that links portable computers to cellular phones
FINANCIALS
Fiscal 1993: \$9.8 million loss
Annual sales: \$100 million
NUMBER OF EMPLOYEES
Approximately 200
FOUNDED
1984

now; how are we going to upgrade?" said Trey Thompson, systems analyst at Citgo Petroleum Corp. in Tulsa, Okla., echoing concerns among his peers. Some are wondering whether the PowerPC will render their current Macintoshes obsolete. Others are confused about the upgrade path to the PowerPC. Clearly, Apple needs to address these issues.

"Moving to the PowerPC, and keeping users interested along the way, is absolutely the most critical battle for Apple to win," said Jean-Louis Gasse, former head of the Apple Products division and currently chief executive officer of Be, Inc., a San Jose, Calif., startup.

Unique burden

Unfortunately, the problems go far deeper than shifting to a new platform and stem from Apple's *raison d'être*—its desire to be different. Initially, that meant distancing itself from the herd with its proprietary software, particularly with its once-distinctive interface.

But with the enormous acceptance of Microsoft Corp.'s Windows graphical user interface (GUI), Apple's new CEO, Michael Spindler, knows he has to take the battle to new ground.

"This is not about the GUI anymore. We're way beyond that," Spindler said last week at the Seybold Publishing Conference in San Francisco, his first domestic public appearance since he took the CEO role four months ago.

"Good," said Rodney Schmidt, a systems analyst at Eli Lilly and Co. in Indianapolis, in response to Spindler. "Apple needs to support and integrate itself with the standards, whatever they are and whomever produces them."

"Spindler believes they have to put their heads down and get down to business," said Pieter Hartsook, publisher of "The Hartsook Letter," a Macintosh-specific newsletter in Alameda, Calif. "The feeling is that they have to get serious and stop fooling around."

Essentially, Apple must become a team player and provide open solutions. And yes, Spindler says that's right there at the top of his list. But again, users will believe it when they see it.

Partnerships key

A key part of meeting these goals will be continuing to team up with other companies to expand its technology base. At its Enterprise Computing Conference, for instance, Apple moved aggressively to court corporate customers with news that Oracle Corp. will port its Oracle 7 database to Apple's high-end server. That marked an important milestone on Apple's road to respectability in the corporation, something with which it has traditionally struggled.

Another request: "A decent multiplatform development environment," said Bob Novakoski, a business planner for LAN services at SaskTel in Regina, Saskatchewan. Apple's Bedrock initiative is a step in this direction.

Interoperability issues are getting a big push as Apple delivers its Apple Open Collaboration Environment (AOCE), a set of application programming interfaces (API) that promise to link and inte-

grate disparate applications running under System 7. Developers will be able to tap into the power of the extension by simply hooking into AOCE APIs.

"These kind of moves and partnerships carry a lot of clout because they legitimize Apple in the eyes of a lot of IS folks," said Robert Anderson, a senior analyst at A.O. Smith Automotive Products Co. in Milwaukee.

Apple is also working on fixing its problems with industrial-strength sup-

port. "The problem is that Apple comes along with this great technology, and they say we have to figure out how to make it work in the real world," said Matt Rosen, assistant director for technical services at San Joaquin Delta College in Stockton, Calif. A corporate support package slated to arrive last month will not ship until November, sources said.

All these changes may be making skeptics reassess the company. Several accounts that had earlier decided to leave

the Apple fold are rethinking their decisions. The New York accounting firm KPMG Peat Marwick, for instance, has postponed plans to replace its 35,000 Macintoshes with Windows machines. Similarly, Westinghouse Savannah River Project has reconsidered its plans to replace 7,200 Macintoshes with IBM PCs because the Macintosh is cheaper in terms of training and administration, a U.S. Department of Energy spokesman said.

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10PLB0	3380	13275	104	9	8084	132	61	5191	31	2651	0.232	16	2	2	160	4422	15	61	15	5.9
---AFTER-CPK-->																				
10PLB1	3380-K	59825	365	38	3225	Extents Combined		7574	48	2051	0.243	48	416	416	5242	15	47	3.9	0	
---AFTER-CPK-->																				
10PLB5	3380-K	52825	458	49	38650	615	97	1175	82	130	0.615	668	160	4422	15	61	15	5.9	0	
---AF-->																				
SM5LB0	3380	3351	3	10279	Free Space Consolidated			2996	2	1503	0.098	2996	2	1503	0.098	2996	2	1503	0.098	2996
---AF-->																				
TS0WK1	3380	3275	249	7	7591	65	57	5684	31	2205	0.178	0	0	0	0	0	0	0	0	0
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IBM blends service

CONTINUED FROM PAGE 1

ican market in a new services umbrella organization headed by general manager Dennie Welsh, who remains chairman of IBM's Integrated Systems Solutions Corp. outsourcing subsidiary. Some 18,000 employees will now be under Welsh's purview.

Key to the strategy, IBM sources said, is getting all the pieces of the services pie to concentrate on the same vertical markets. These include banking, health care, insurance and manufacturing. IBM is also imposing common financial and performance measurements across the services businesses to provide more consistent pricing and to help the com-

pany better measure profitability.

"With moves like this, IBM is transitioning toward looking more like a services company," said Bob Djurdjevic, president of Annex Research, a consultancy in Phoenix. Another reason the move is important, he added, is that it could well "get IBM back into the boardrooms" of customers.

To get there, IBM's consulting group intends to work more closely with customer executives on strategic planning

issues. The rest of the services organization will implement these plans. Providing these kinds of high-level services will enable IBM to rekindle the high-level customer access it had in its heyday.

IBM, however, is battling some customers' perceptions that some of its services are overpriced and overrated. "We don't expect to get service for nothing, we're willing to pay for it," said Randy Aldrich, technical support supervisor at Federal Kemper Insurance Co. in Decatur, Ill.

"But IBM's Consulting Group is charging about \$130 an hour per consultant for services. We'd like to see that come down to under \$100 per hour," more in line with other service providers, he said.

On the plus side

IBM executives were unavailable for comment because of a news blackout imposed until after IBM's third-quarter financial results are announced tomorrow (see news short page 6).

But one source close to the company defended IBM, saying the company continues to invest in employee training in these businesses and is bringing in new talent. Out of the 3,000 IBM consultants worldwide, between 10% and 15% have been hired from the outside.

Another customer, an information systems vice president at a large manufacturing company in the South, said that six months ago he hired two IBM technicians — at \$235 an hour for the pair — to convert System/36 software to AS/400 software. "And we had to train them on the AS/400," he said.

Daniel Roberts, president of Ouellette & Associates Consulting, Inc. in Bedford, N.H., said, "We've been receiving mixed feedback from customers on IBM services. Nothing's really changed yet."

Others are more willing to give IBM a chance. Although Federal Express Corp. in Memphis has not used many outside services, Senior Vice President Dennis Jones said he is impressed with what he has seen from IBM so far and would consider the company for future services needs.

Still, the hope is that IBM will continue to derive an increasingly larger percentage of its revenue from software and services, and that will probably continue to be the case, particularly with the increased focus, observers said.

IBM service revenue for 1992 was an estimated \$7 billion, according to Julie Schwartz, an analyst at Dataquest, Inc. in Framingham, Mass.

John Jones, an analyst at Salomon Brothers, Inc. in San Francisco, estimated that 1993 services revenue will grow to about \$9.5 billion worldwide, with about 40% of that figure attributable to the U.S.

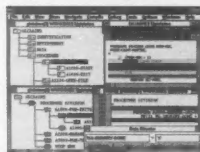


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News Shorts

Another down quarter expected for IBM

Analysts do not expect much from IBM's third-quarter results, due to be announced tomorrow. Estimates range from a loss of 37 cents per share to about break-even if revenue reaches \$15 billion. For the fourth quarter, traditionally IBM's strongest, analysts expect the company to return to the black.

Objects mix it up with database

Montage Software, Inc. in Emeryville, Calif., last week announced what it calls an object relational database management system and a concurrent-use pricing model of less than \$1,000 per user. Montage supports complex object-oriented data types such as image and audio while also providing SQL query capabilities, the company claimed.

Ellison named in sexual harassment suit

Oracle Corp. Chief Executive Officer Larry Ellison was named in a sexual harassment and wrongful termination lawsuit filed last week by Adelyn Lee, a former executive assistant. Lee, who also named Oracle and Craig Ramsey, her ex-supervisor and vice president of USA commercial sales, in the suit, alleges that she was wrongfully fired soon after breaking off an affair with Ellison. Oracle declined to comment beyond a written statement, part of which said that Lee's dismissal was the result of her "unsatisfactory performance and ... complaints about her performance from Oracle managers and co-workers."

French government plans Bull infusion

The French government last week proposed an infusion of 7 billion francs (\$1.2 billion) for Groupe Bull and said it would be "the last time" it puts money into the troubled company before trying to sell off its majority share. The government also named Jean-Marie Descarpentries to take over as Bull chairman from Bernard Pache, who sought more government financing, according to reports in the French press.

Fast Ethernet gets boost

A coalition of networking vendors led by Grand Junction Networks, Inc. said it will make available this week a specification that will provide users with interoperable products for 100M bit/sec. Ethernet networks. A key benefit of the 100Base-X standard is that it is based on Ethernet's media access control method, Carrier Sense Multiple Access with Collision Detection, which means customers can migrate to Fast Ethernet technology without special training. A vendor coalition, led by Hewlett-Packard Co. and AT&T, is proposing a Fast Ethernet standard based on a new media-access control method called demand priority, which would require training and additional cabling.

SHORT TAKES R. Elton White has announced his plan to retire as president of NCR Corp. in early 1994. White, 51, joined NCR in 1967 as a price analyst. ... **The Object Database Management Group**, a vendor consortium, said last week it has agreed on a database interface standard. The group said the specification will provide a single interface for its object database applications. ... **AST Research, Inc.** will today introduce its first Pentium-based desktop, the Premia LX P/60. The Pentium system will be priced starting at \$3,325, with no hard drive and 8M bytes of RAM. ... **Wang Laboratories, Inc.'s** management triumvirate was reduced to a duo last week with the resignation of Michael Mee, who had been chief financial officer and also acted as chairman of the company's board of directors. ... **Gateway 2000, Inc.** has filed an initial public offering worth as much as \$160 million.

More news shorts, page 16

Software broadens protocol choice

By Joanie M. Wexler
SAN JOSE, CALIF.

User angst over having to choose between Novell, Inc.'s NetWare applications and corporate Internet Protocol (IP) backbones should end Friday when Novell ships long-awaited software that separates applications from their underlying transport protocols.

The NetWare/IP NetWare Loadable Module (NLM) brings "freedom of choice" to the backbone, said Bob Davis, vice president of marketing at Novell's Unix Systems Group here.

The software does this by separating NetWare applications from their native IPX protocol and giving users the option of running them over IP, a widespread—and growing—standard for corporate wide-area network backbones.

WAN users cheer

"This is a product that has long been anxiously awaited by customers with large, router-based

WANs," said Jay Batson, an analyst at Forrester Research, Inc., a Cambridge, Mass., consultancy. "These people tend to be IP-sympathetic."

For example, "We are probably going to be doing NetWare/IP here because our long-range plan is to move to TCP/IP over our Internet," said Bill Bergdorf, senior internetwork analyst at Cargill, Inc. in Minneapolis. The reason is, "Novell IPX is so chatty over an internetwork," despite vigorous efforts by Novell to hone the protocol for wide-area network applications.

One such Novell effort is Burstmode, which allows communicating network nodes to transmit multiple packets before an acknowledgment is sent by the receiving station. This scheme differs from standard IPX, which requires an acknowledgment after every packet and clutters up the network.

"We ran tests with Burstmode IPX, IPX and IP and found IP was

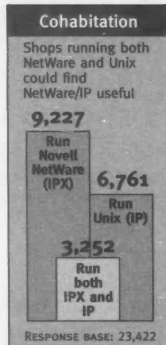
faster in transferring files," Bergdorf said.

Marc Trachtenberg, chief technology officer at NetLAN, Inc., a Novell reseller in New York that has been working with NetWare/IP beta customers, said it is likely that "banking and trading floor customers with large investments in Unix will really take a strong look" at the NLM.

RAM overloads

He said, for example, that one customer considered eliminating NetWare from its back-office environment to alleviate router configuration complexity, expertise and "RAM-cram"—desktop issues associated with running both IPX and IP. However, since the company decided it needed the enabling aspects of NetWare in the back office and Unix in the front office, NetWare/IP could solve both problems, Trachtenberg said.

NetWare/IP builds on Novell's efforts to blend NetWare and Unix environments. The company's 2-year-old LAN Workplace, for example, provides a given workstation connectivity into both NetWare and Unix computing communities, though the applications stay specific to the underlying IPX or IP protocols, Davis explained.



Source: Computerworld Database Division

National Semiconductor tries hand at adapters, hubs

By Elisabeth Horwitz

National Semiconductor Corp. is expected this week to branch out from its traditional chip business to the comparatively higher-margin network adapter and hub market, with Novell, Inc. providing the ready-made distribution through its value-added reseller network.

The chip maker will start out in the low-end Ethernet hub and adapter market, going up against such entrenched veterans as 3Com Corp., IBM and Hewlett-Packard Co., according to Frank Dzubeck, president of Communications Network Architects, Inc., a Washington consulting firm.

Market newcomer

Analysts agreed that National Semiconductor is well-positioned to make a splash in the low-end market, particularly given that the vendor supplies about 70% of the chips to Ethernet vendors, according to Dzubeck. The chip maker's presence should speed low-end hubs and adapters toward becoming strictly commodity items, he added. Rival Intel Corp.'s entry in

to the adapter market some years ago "did the same thing, devastating the price."

National Semiconductor and Novell will also work together on higher-end, higher-speed network technologies, such as Asynchronous Transfer Mode (ATM), analysts said.

Effective alliance

The joint clout of Novell and National Semiconductor could hasten ATM's progress toward a truly standard, affordable technology, said Charlie Robbins, an analyst at Aberdeen Group, a Boston research firm.

The move is a good one for National Semiconductor, given that its chips represent the bulk of development work behind a given adapter but only about 20% of the profit, Dzubeck said. "They want to get the rest."

Novell and National Semiconductor will also work to integrate Novell's NetWare capabilities on adapters and possibly hubs, analysts said. Novell already has a similar deal with SynOptics Communications, Inc. and should

shortly announce yet another deal of this kind with Cabletron Systems, Inc., said one analyst.

The idea is for NetWare services, such as faxing and asynchronous communications, to run directly on and be managed from the hub, the analyst said.

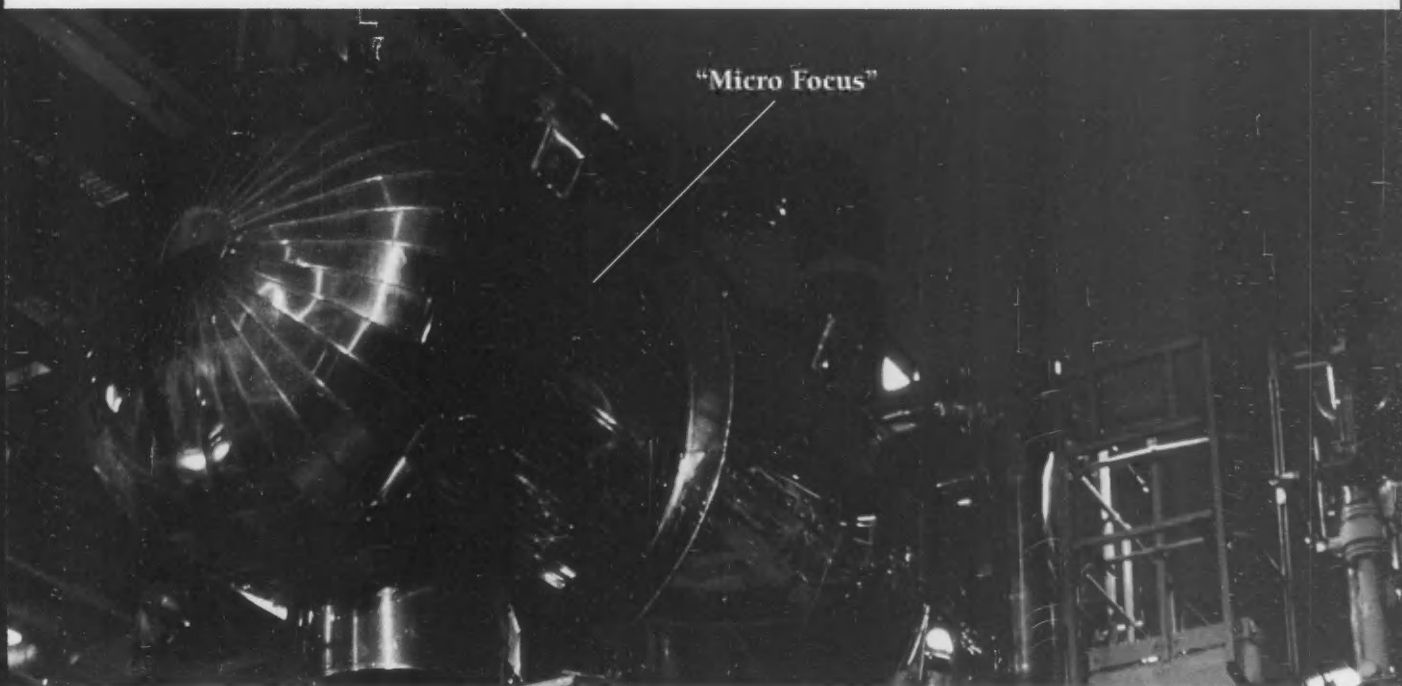
Corrections

Due to a reporting error, a story in the Oct. 18 issue incorrectly stated that Cellular One's client/server billing system was built internally. Computer Sciences Corp. built the system and worked with Cellular One developers to customize it. However, comments about Cellular One's strategy were based on the inaccuracy.

A photo identified as Bob Holmes that ran on Page 20 of the Oct. 18 issue was not Mr. Holmes.

A story in the Oct. 11 issue quoted a user as saying that NCR Corp. offers PCs only on a build-to-order basis. NCR, in fact, also offers off-the-shelf configurations.

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Office 4.0 facility eases use

By Michael Vizard
NEW YORK

To help information systems shops gear up with the next generation of highly integrated application suites, Microsoft Corp. last week laid out a multitiered strategy designed to make its suite easier to manage.

Microsoft Office 4.0, a suite of applications based on forthcoming upgrades of Microsoft applications (see chart), will support Version 2.0 of the Object Linking and Embedding (OLE) interface [CW, Oct. 11].

By adding support for OLE 2.0, Microsoft is providing a facility that allows in-place editing across multiple applications, a true drag-and-drop protocol for sharing data across those applications and a facility through which programming languages can serve as a common macro language across multiple applications.

To help deal with some OLE management issues, Microsoft has included a Microsoft Office Manager (MOM) facility in Office 4.0 that serves as a program manager for the suite [CW, Oct. 18]. Using this tool, an IS manager can have third-party and custom applications displayed on the same button bar as Microsoft Office applications.

Additional tools on the way

However, while MOM serves to manage applications on an individual system, Microsoft is also working on a second level of management tools for managing documents.

And finally, Microsoft has included an Object Browser tool in each of its applications, which keeps track of all the OLE 2.0 objects available to a Windows developer.

"Right now it's kind of daunting. There are so many objects available using OLE. I definitely see room for a more robust object manager on top of the browser," said Pete Claar, a developer with a large Northwest retail store who has worked with OLE 2.0.

"From a hierarchical perspective, you'll have MOM, then a document management tool and the Object Browser," said Mark Kroese, general product manager for Microsoft Office.

But while Microsoft has moved to provide management tools for individual systems that use OLE 2.0, industry analysts noted that Microsoft's lack of an enterprise focus is likely to slow the widespread endorsement of OLE 2.0 applications across IS organizations.

In particular, they pointed out that OLE 2.0 does not allow users to access resources — data across a network, for example — on other users' systems. For OLE 2.0 to become

widely accepted, analysts said Microsoft will have to provide the ability to transparently access resources that way.

"With objects, you shouldn't have to know where a particular object is on the system or network to use it," said John Donovan, an industry analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

"We're still in a file-oriented world. Beyond using stuff like the drag-and-drop protocol on your desktop, most IS shops won't take full advantage of what things like OLE offer until there are object operating systems on their desktops," said John Faig, an industry analyst at Meta Group, Inc. in Stamford, Conn.

Sizing up the suites					
While Microsoft plans to add some cutting-edge technologies to its suite, Lotus will continue to have key advantages in terms of availability and support for workgroup computing					
Features	OLE 2.0	Shared icons	Common macro language	Notes support	Available
MICROSOFT OFFICE 4.0 • Word 6.0 • Excel 4.0 • PowerPoint 3.0 • Access 1.1 (professional version only) • Mail 3.2	✓	✓	✓		YEAR'S END
LOTUS SMARTSUITE 2.1 • Ami Pro 3.01 • 1-2-3 Release 4.01 • Freelance Graphics 2.01 • Approach 2.1 • Organizer 1.1		✓		✓	NOW

For example, Directors Mortgage Co. in Riverside, Calif., recently opted for SmartSuite from Lotus Development Corp. because Lotus applications are better integrated with one another. In contrast, OLE 2.0 is not yet widely supported and will require Directors Mortgage to essentially rewrite all of its custom applications to support it, said Bob Dingle, vice president of production technology.

"From a technical point of view, OLE 2.0 is a whole new platform. We're not going to be interested in that until I perceive that Windows and NetWare are no longer doing the job for us. I don't think I'll be worrying about OLE 2.0 for at least 12 months," Dingle said.

In fact, the only OLE 2.0 application that will initially be available from Microsoft is its Word 6.0 word processor.

Short wait for 32-bit programs

By Michael Vizard
NEW YORK

■ Users can expect to see the first 32-bit iterations of spreadsheets and word processing applications from Microsoft Corp. in the first half of next year, according to Microsoft Chairman Bill Gates.

Speaking at the launch of Microsoft Office 4.0 last week, Gates promised that 32-bit versions of the Excel spreadsheet and Word word processor will appear on Intel Corp. systems in the first quarter. In the second quarter, Microsoft will deliver 32-bit versions of these applications for RISC systems.

The applications will run on Windows NT and the upcoming 32-bit Windows 4.0, which is the follow-on product for 16-bit Windows 3.1.

While 32-bit versions of these applications will be able to work with larger data sets and provide significant speed improvements, most sites are likely to initially perceive them as providing performance overkill.

However, there are a number of applications in the financial and scientific communities that require 32-bit spreadsheets to run effectively, according to Don Baarns, president of Baarns Consulting Group, Inc. in Sylmar, Calif.

Baarns noted that a client/server application in which a 32-bit implementation of Excel is the front end to a 32-bit SQL Server database would provide a huge performance advantage.

But only those few who are building gigantic spreadsheet applications are likely to benefit from 32-bit applications in 1994, noted Daniel Gasteiger, editor of the "Spreadsheet Consultant" newsletter in Cambridge, Mass.

In fact, most vendors and information systems shops are not expected to do any major 32-bit application work until Microsoft delivers its first beta release of Chicago in December.

But while most other software vendors will wait for Chicago before moving up to 32 bits, Microsoft's need to have a full set of native 32-bit applications for NT is driving its efforts.

ATM will start with WANs

By Joanie M. Wexler

In the wake of several Asynchronous Transfer Mode (ATM) developments last week, some analysts and users predicted that the communications technology is likely to catch on in wide-area networks before it hits the desktop.

And, they added, the initial role of WAN-capable ATM switches, such as those making waves last week from Motorola Codex, StrataCom, Inc. and others, is likely to be that of a humongous multiplexer.

Such boxes, in an era of corporate transitions from multiple network types to the future ATM network nirvana, would accept various data and voice feeds, aggregate and compress them, and spit them out over one high-speed WAN link, which could include ATM.

Witness, for example, Motorola Co-

dex's \$60,000-and-up 6950 SoftCell ATM Networking Node product. The bandwidth management-oriented WAN device, like many low-end products on the market today, uses compression and traffic prioritization schemes to help companies squeeze more out of their costly telecommunications links as their computing enterprises become increasingly dispersed, analysts said.

Traffic pattern

The 6950 accepts frame-relay, voice and circuit-switched traffic, compresses it over an internal, Codex-developed cell-relay scheme and spits it out over T1. Integrated Services Digital Network or 45M bit/sec. ATM wide-area links, explained Gail Smith, Motorola Codex's director of worldwide product marketing.

Smith estimated a 200% to 300% performance improvement over traditional

time-division multiplexing techniques and a payback period of nine months.

"Codex, with its huge installed base, can do a lot of handholding to migrate customers" from myriad network types to ATM with the 6950, said Joe Noel, an analyst at Dataquest, Inc. in San Jose, Calif.

In the case of StrataCom, Inc.'s BPX ATM switch, announced in January and delivered last week, the multiplexing function would gather ATM-only traffic from multiple sites, like the 6950, rather than traffic from a single site. The BPX relies on the conversion of other types of traffic to ATM elsewhere, such as within its own IPX frame-relay device.

Noel predicted that the BPX is likely to "be a carrier switch for a while; I don't think corporate networks are up for its horsepower yet."

Some users beg to differ, though (see story page 71). For example, John Boyd, communications director at Northeast Utilities System in Weathersfield, Conn., is using the BPX on his premises as a win-

dow into his hybrid private/public WAN: "We're looking at ATM to be the solidifying manager of media," he said.

ATM standards specify initial speeds of T3 (45M bit/sec.). However, today only about 15% of T3 networks in the U.S. stretch beyond 500 miles, the crossover point where private T3-speed ATM networks become cost-effective, said Rick Malone, principal at Vertical Systems Group, a Dedham, Mass., consultancy. This means T3 pricing must drop dramatically for wide-area ATM to catch on, he said.

Last week's ATM news:

Motorola Codex rolls out the 6950 bandwidth management-oriented premises switch with an ATM WAN interface; StrataCom delivers its BPX switch, a pure ATM WAN product; General DataComm, Inc. adds a High-Speed Serial Interface to its Apex ATM switch.

*"If interoperability was just
about connecting data with
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Single-console net control gets boost

By Lynda Radosevich

Hewlett-Packard Co. and Cabletron Systems, Inc. announced additions to their enterprise network management systems that promise to broaden options for managing diverse network elements from one console.

HP said it will deliver software that lets network managers control TCP/IP and SNA networks from one HP OpenView management station in first-quarter 1994.

Cabletron said it will offer in November a version of its Spectrum network management software that runs on top of other management platforms and allows those applications to manage its network hardware. The platforms include HP's OpenView, IBM's NetView/6000, Novell, Inc.'s NetWare Management System and Sun Microsystems, Inc.'s SunNet Manager.



HP has added technology to OpenView that enables multi-protocol network management from one console

Now I have different staff managing TCP/IP and SNA networks," said Wayne Bowker, advanced an-

Double exposure

The network management market, worth \$3.9 billion in 1992, will reach \$10.2 billion by 1996, according to research firm Market Intelligence in Mountain View, Calif.

alyst in the information technology department at 3M Co. in St. Paul, Minn. "The benefits of combining are that ultimately we can resolve problems quicker, cut down on management staff and use them other places."

The HP product is based on technology licensed from Peregrine Systems, Inc. Combined with the currently available HP software for NetWare networks on an OpenView platform, it allows multiprotocol network management from one console, according to David Schwaab, an HP marketing program manager.

However, some analysts and users contacted said the Peregrine Systems-based node takes up too much memory. Schwaab responded that the 64M to 125M bytes of workstation memory required is not unreasonable for large networks. Additionally, HP is working

with Peregrine to reduce the amount of memory required and to reduce the network bandwidth requirements, he said.

Practical side

Meanwhile, the main benefit to Cabletron's approach is that it allows the hub customer to use the management system it already has in place, said Jill Huntington-Lee, principal analyst at Brandywine Network Associates, a consultancy in Cinnaminson, N.J.

Cabletron said it will deliver, in the first quarter of 1994, data gateways that allow the network management applications to share information, with Spectrum riding on top as a "manager of managers," as well as the Spectrum 3.0 distributed network management system in the second quarter.

Becoming a LAN manager means slogging through lots of manuals and CompuServe forms and learning from mistakes. Page 114

Good news, bad news for IBM on APPN front

By Joanie M. Wexler

In what could be the kickoff in a series of bittersweet victories for IBM in its determination to make it big in the distributed networking arena, several communications companies last week said they have licensed "the next SNA" software from a vendor other than IBM.

Data Connection Ltd. (DCL) has been chosen by Cabletron Systems, Inc., Hewlett-Packard Co., Hitachi Data Systems Corp., Memorex Telex, Northern Telecom, Inc. and Unisys Corp. as their vendor for Advanced Peer-to-Peer Networking (APPN) source code [CW, Oct. 18].

APPN is IBM's architecture for migrating hierarchical SNA networks to a peer-to-peer structure that supports new client/server applications alongside terminal-to-host applications.

All aboard

DCL rolled out its iteration of APPN Network Node, which includes routing functions, and its End Node software last spring. Router maker Wellfleet Communications, Inc. said at the Interop '93 August show that it had become the first vendor to hop on the DCL bandwagon.

The growing acceptance of another vendor's IBM code signifies an industry bent on freeing the user community from the potential product delays and price premiums that result from a single ven-

dor's control of a technology. And while the vendor flockings will cost IBM lost licensing fees, IBM looked on the bright side: More sources for APPN will probably mean more APPN in user shops, said Marcia Peters, lead APPN architect at IBM.

"[DCL] did a super job with the code," she said.

One analyst, Dave Passmore, a vice president at Gartner Group, Inc., a Stamford, Conn.-based consultancy, said he was surprised that IBM looked on the situation as opening up APPN, "rather than suing DCL."

Crucial timing

Licensing vendors indicated time-to-market motivations. For example, Tom Burkhardt, director of IBM connectivity products at Cabletron, said that what was important was that the DCL code is "written in such a way that our engineers can port it quickly" to any platform.

Still, it is not clear how much near-term demand there is for APPN. On the one hand, "our level of customer requests for APPN has increased dramatically over the last 10 months," said Don Rosenbaum, research and development manager at HP.

However, Burkhardt said, the only trend he sees is smaller SNA shops getting rid of SNA altogether. "I don't see a pattern in larger networks; some are stabilizing, downsizing or even expanding their 3270 populations."

SNA shops to get distributed tools

By Joanie M. Wexler
WHITE PLAINS, N.Y.

Far-reaching additions to the IBM Networking Systems product line last week should help move some SNA shops that are on a distributed computing bender a notch closer to their goal of one cohesive network.

The IBM moves included bundling a 3174 Establishment Controller, a PS/2 server, an Ethernet switch and a transparent bridge into the IBM 8250 intelligent wiring hub.

Todd Dagues, vice president of communications research at The Yankee Group in Boston, said he sees the hub-bundling as reflective of companies' moves from controller-attached terminals to LANs. "There is an uncomfortable period when you're caught with both the old and the new," he said.

"Users want LAN-based processing but can't give up [SNA's] class of service."

Dagues explained that because hubs evolved primarily for cohesive management of LAN internetworks, collapsing IBM gear into the wiring closet with LAN paraphernalia "at least means you're not managing two environments."

In addition, IBM rolled out performance and connectivity enhancements to the 3746 Communications Controller Model 900. The 3746 is the "multiprotocol" version of IBM's mainstay 3745 front-end processor.

IBM said a new Synchronous Data Link Control line adapter for the controller should yield as much as a threefold throughput improvement. It also announced that it plans to support frame relay on the device.

The 3746 moves "are kind of a sleeper," said Steve Romaine, a consultant at Informed Technology Decisions, Inc. in Green Farms, Conn. Corporate moves to client/server for mainstream applications "will require greater file-transfer rates, and object-oriented processing will eat bandwidth," requiring the added horsepower, he pointed out.

However, the usefulness of IBM's migratory products will depend on individual user company network plans. For example, SNA shops simply weaning themselves off mainframe computing may have no use for the products.

Loral Aerospace Corp. in Newport Beach, Calif., for one, is dumping IBM protocols entirely, despite the fact that it runs about two-thirds of its traffic over SNA today, said Bill Conley, manager of corporate information systems.

Rather than using the peer-oriented IBM enhancements, he said, "we'll pretty much let what we have die, reallocate bandwidth and go on from there."

IBM also delivered software for running TCP/IP applications over SNA backbones—a product implementation in the IBM Networking Blueprint called AnyNet for letting applications run across non-native transport networks [CW, Oct. 11]. The jury is still out on AnyNet, though.

"The problem is there are so many choices, people are still at the stage of sorting through to see what makes sense," Romaine said.

"IBM has to evangelize with AnyNet because people don't understand it," Dagues added. "The necessity for the function is there. But users need proof, delivery and price."

IBM's product announcements included the following:

Smart hub modules:

- PS/2 server: Shipping Dec. 31 for \$7,000.
- 3174 controller: Shipping Jan. 28, 1994, for \$12,990.
- Six-port Ethernet bridge: Shipping Jan. 7, 1994, for \$8,920.
- Ethernet switch: Shipping March 25, 1994, for \$6,095.
- Hub-specific management program: Shipping Jan. 28, 1994, for \$995.

AnyNet/2 Sockets over SNA Gateway for running TCP/IP communications applications across SNA nets. Shipping Dec. 31 for \$1,950.

CA to reveal plan for managing nets

CONTINUED FROM PAGE 1

A handful of products available today address low-level systems management capabilities across heterogeneous environments. These include IBM's NetView/6000 and Hewlett-Packard Co.'s OpenView network management packages, which are beginning to offer systems capabilities. However, analysts said none are robust enough to meet user requirements.

CA's "master console" version of CA-Unicenter would offer features such as security, storage management, report management and job scheduling management. The master console version will differ from the systems-specific client/server ports of Unicenter in that customers will be able to remotely manage several operating systems, such as OS/2, Unix and Windows NT, from a single point in the enterprise.

CA is expected to deliver the master console product in the next six to 12 months, analysts said.

Platform proliferation

Client/server versions of CA-Unicenter will appear on the following platforms:

PLATFORM	DELIVERY DATE
IBM's OS/2	March 1994
Sun's Solaris	June 1994
IBM's AIX, Sequent's Symmetry and Pyramid	First-quarter 1994
Novell's NetWare	First-quarter 1994 (beta)
Novell's UnixWare, Microsoft's Windows NT, NCR's System 3000, Data General's DG-UX and Tandem's Cyclones	Second- or third-quarter 1994 (beta). Deliveries by end of 1994

Source: Kidder, Peabody & Co., New York

Users said they anxiously await the fruits of CA's labor but have limited expectations.

"I can't see it being done easily," said M. Lewis Temares, chief information officer at the University of Miami, who said he was familiar with CA's plans.

However, Temares said a master console product would alleviate many of the problems the university faces in having to manage its enterprise from five control points. "A multivendor client/server version of Unicenter would be a lifesaver. It would save the university a bundle of aggravation," Temares said.

Answering critics

Analysts familiar with CA's plans lauded the vendor for setting its sights on an initiative they described as overwhelming, yet one that users sorely need.

"By introducing a product with a client/server architecture, CA will answer a lot of its critics. The market for data center Unix management is relatively small, but the market for client/server-based Unix management will be very large," said Igor Stenmark, program director for software management strategies at Gartner Group, Inc., in

Stamford, Conn. Stenmark was unsure of the potential size of the client/server Unix systems management market.

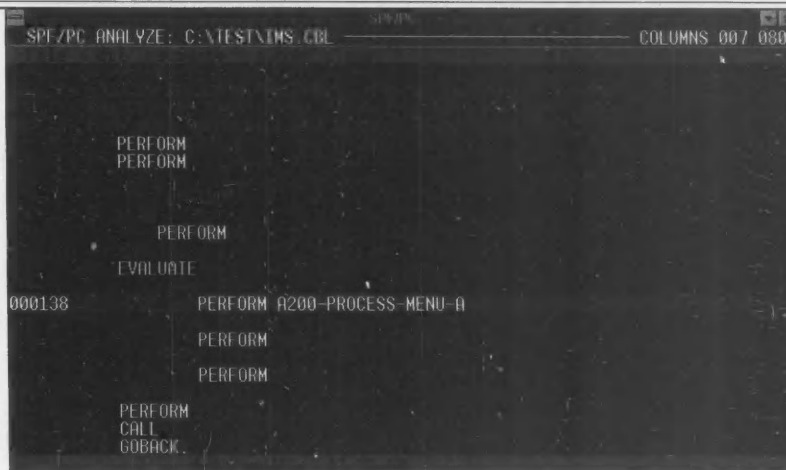
The first client/server version of CA-Unicenter, which is being designed for OS/2, has been in development for the past year and will enter beta testing in

the next few weeks, with delivery scheduled for early next year, according to Charles E. Phillips, a financial analyst at Kidder, Peabody & Co. in New York.

CA's plans to deliver client/server Unicenter products for NT sparked the interest of Ronan McGrath, a vice president of information systems and accounting at the Canadian Railroad in Montreal. McGrath said the railroad is planning to switch its OS/2 application development to NT in the next few years.

"We're interested in viewing a client/server version of Unicenter for NT," McGrath said.

A few NetWare users also expressed strong interest in CA's plans. "If we can centralize a lot of those management functions, like single user IDs, single passwords and file management capabilities, that would be a big help," said Gary Graham, coordinator of data management at Home Oil Co. in Calgary, Alberta.



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Laraine Rodgers is joining **Xerox Corp.** on Nov. 1 as vice president and chief information officer of U.S. Customer Operations, a unit based in Rochester, N.Y. The post was previously held by the current CIO of Xerox, Pat Wallington. Rodgers is currently director of MIS for the city of Phoenix.

Digital Equipment Corp. last week surprised analysts with a larger than expected \$83.2 million loss for its first fiscal quarter, as revenue declined 4% from the previous year [see chart page 133]. The company lost \$103.2 million from operations; product sales dropped 12%, and Digital's services business fell 6%. Company executives blamed the results on low demand in Europe and negative currency translations but acknowledged U.S. sales were down slightly.

Zenith Data Systems will tomorrow announce the first desktops it co-developed with **Packard Bell Electronics**, according to sources close to Zenith Data. Called the Z-Select 100, it features a range of **Intel Corp.** 486SX, DX and DX2 processors, Pentium OverDrive upgrade slots, a choice of Ethernet or Token Ring, plus preinstalled shells for various network operating systems, according to the sources. Pricing will start at \$1,700 for a 25-MHz 486SX with 4M bytes of RAM and a 170M-byte hard drive, the source said.

Computervision Corp., the remnant of the former Prime Computer, Inc., last week said it plans to quit the hardware resale business at the end of this year and cut 2,000 employees during the next 18 months—a move that will reduce its 4,700-person work force by 43%. Computervision, which got 14% of its third-quarter revenue from hardware sales, has signed a deal for primary supplier **Sun Microsystems, Inc.** to sell directly to its computer-aided design customers and said it is trying to negotiate similar agreements with other workstation vendors. The company lost \$543 million in the third quarter, including a \$515.8 million restructuring charge, as revenue fell from \$234.2 million a year ago to \$183.9 million mww.

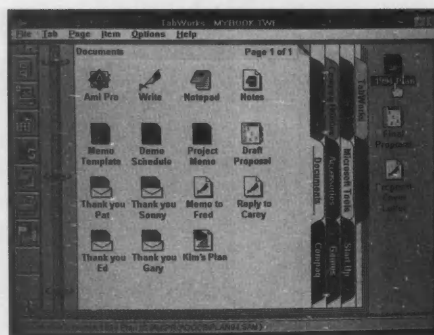
Stew Leonard, owner of the Connecticut dairy giant, was sentenced last week to more than four years in prison and fined \$847,000 for his role in a sophisticated tax-fraud scheme that stands as one of the nation's largest-known computer-driven tax evasion cases. Leonard, 63, pleaded guilty earlier this summer to skimming more than \$17 million in sales from his family's Norwalk, Conn., store by customizing its computer programs.

Compaq makes Windows easier

■ Compaq Computer Corp. last week claimed that with its upcoming line of PCs it will remarket software that will make Windows applications easier to use.

Developed by Xerox Corp.'s XSoft division, TabWorks acts as a shell over Windows, turning the PC interface into what resembles a student notebook with tabs. It looks much like the interface for Lotus Development Corp.'s Organizer or Go Corp.'s PenPoint operating system.

Officials from Compaq and XSoft claimed that beta users completed tasks 25% faster in Tab-



TabWorks uses a three-ring notebook metaphor

"This is a much more intuitive, easy way to do work — plus people are used to the notebook metaphor," said Lorie Strong, Compaq's vice president of portables and software marketing. Strong said TabWorks will appear on

Users and beta testers said the product held interest for them.

"It's a little more drag-and-drop-oriented than Windows," said Steve Verderber, a systems analyst at Varian Associates, a maker of medical and silicon production equipment in Palo Alto, Calif.

While Compaq has exclusive one-year rights to TabWorks, the program runs on any PC-compatible system. Varian's Verderber, for instance, uses a system from a small clone maker. Non-Compaq users can buy TabWorks through Compaq DirectPlus or Compaq resellers for \$69 (\$99 after Jan. 1).

CONTINUED FROM PAGE 1

paq last week said third-quarter earnings rose 118% to \$107 million, on sales of \$1.75 billion, a 64% increase (see chart page 133).

Analysts said they expect the IBM PC Co. to also post uncharacteristically large sales increases in its third quarter. The ValuePoint line alone has shipped more than 1 million units in its first year.

"It shows that top-tier market momentum is definitely growing," said Steven L. Eskinazi, an analyst at Alex. Brown & Sons, Inc.

Several large users contacted illustrated how the PC Co. and Compaq have regained corporate accounts.

"We've definitely moved back," said Paul Bandrowski, manager of advanced technology at Sara Lee Corp. in Chicago. He said his company had been purchasing desktops largely from CompuAdd Computer Corp. and Gateway 2000, Inc., but "as the price gap narrowed, we decided it made no sense at all."

Similarly, Joseph Barrett, lead technology analyst at Whirlpool Corp. in Benton Harbor, Mich., said Whirlpool's desktop purchasing was shifting toward the PC Co.'s ValuePoint line, though Dell Computer Corp. and Zenith Data Systems remain on the company's approved vendor list.

Still, many clone makers continue to survive, refuting expectations that Compaq's low-priced desktop initiative, started in June

1992, would kill them off. Second-tier companies such as Zeos International Ltd., which posted its fifth consecutive quarterly loss last week, remain in business and, in many cases, report higher sales, thanks to overall market growth and availability problems of the major vendors.

The clone makers "are showing much higher resilience than we thought," said Gian Carlo Bisone, Compaq's vice president of North American marketing.

But executives at top-tier companies insisted the shakeout will happen. "People like Zeos and others are slowly bleeding to death, rather than having the precipitous losses we expected," said Michael Winkler, vice president and general manager at Toshiba America Information Systems, Inc.

Still, the shakeout may be a trickle. Analysts say the Taiwanese, who control up to 40% of the world market for PCs, have redoubled efforts to stay in business, despite extremely low margins. They point to moves such as the recent purchase of the Everex Systems, Inc. name and assets by YSida, a Taiwanese-backed consortium. Everex thus "dies" yet remains alive, and sources said Everex will introduce a new line Nov. 1.

The 486-based desktop line, the Step Plus, will include integrated features such as SCSI and Ethernet. Everex declined comment.

"We're looking purely at price—Compaq's name doesn't do anything for me," said Rich Davis, a technology consultant at Pacific

Bell's Network Technology district in Sacramento, Calif. Davis said Pac Bell's official corporate standard was Hewlett-Packard Co., but individual business units buy what they want; his unit bought machines from a local systems integrator.

The major vendors may soon put the squeeze on the clone makers, as top executives at HP and Compaq stated publicly they expect to introduce \$500 systems next year.

"I disagree wholeheartedly that the price wars are over — I think you'll see price wars well into 1995, until we have the shakeout everybody's been talking about," said Boris Elisman, an HP product marketing manager.

Do not expect the \$500 name-brand systems to be targeted at corporate users, though. Elisman, for instance, said HP will likely follow a strategy where it will add features to its Vectra lines to keep pricing stable and build lower-priced brands "without the latest and greatest components."

Likewise, IDC said that while prices dropped 13% for desktops and towers and 15% for notebooks in the first half of 1993, price cuts appear to have slowed since then. That condition will last through the first half of next year, when Intel Corp. in particular is expected to face new price pressures [CW, Sept. 27].

"Vendors have milked all the margin out of their low-end lines, though there may be some movement at the high end," said Brian Clarke, pricing analyst at IDC.

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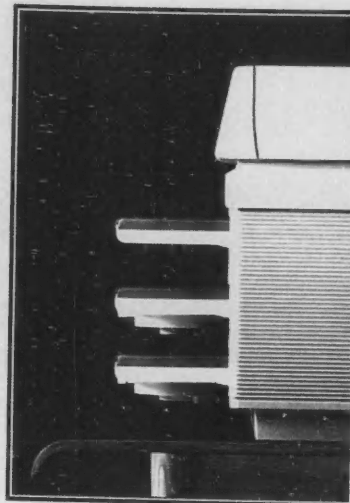
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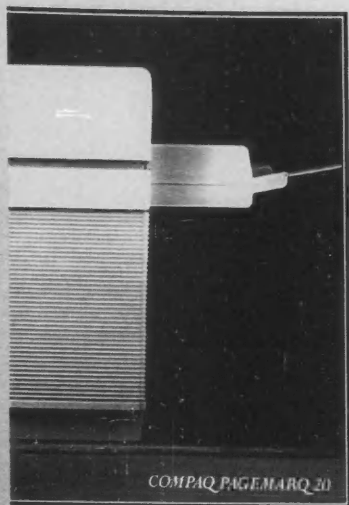
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Lotus, Gupta join to build better Notes

By Michael Vizard and Kim S. Nash
CAMBRIDGE, MASS.

Lotus Development Corp. this week will announce a pact with Gupta Corp. under which Gupta will add Notes support to its line of client/server development tools.

This will be the first in what is expected to become a series of alliances Lotus

will make with relational database management system makers.

The pact between Lotus and Gupta will address two key gripes of Notes users: the need for both better application development tools and better integration with SQL database data.

Notes application developers will gain access to more sophisticated Gupta tools

that will let Notes users build applications with a better user interface than Notes offers today. "Anything that gives me a tool for creating a better interface for Notes is going to be welcome," said Norman Weizer, president of Weizer Associates, Inc., a consultancy in Lexington, Mass.

Secondly, users have criticized the

workgroup product's lack of integration with data stored in RDBMSs that use SQL [CW, Aug. 16]. Connecting Gupta's RDBMS and development tools to Notes would give users a way to build programs that incorporate both traditional row- and table-type data and unstructured data, such as documents and images now stored in the Notes database.

Gupta users, meanwhile, stand to gain access to free-form data types used in Notes applications, such as scanned documents and material stored as images or objects. Gupta's SQLBase already supports binary large objects, but most users have not exploited that capability to its fullest, a Gupta spokesman said.

Links between SQLBase, the SQLWindows application generator and Notes are due out by mid-1994, according to a source inside Gupta. Lotus has already delivered the drivers needed to connect Notes 3.0 to SQL databases. The drivers

currently provide rudimentary read and look-up functions between Notes and RDBMSs. Full-blown data update, or write, capabilities are not expected to appear until Notes 4.0 is released in the latter half of next year.

Meanwhile, Lotus is talking to several other tools makers about similar deals, including Oracle Corp., Powersoft Corp. and Informix Software, Inc., according to Lotus sources. Taken together, the end result of all these deals will be the ability to better integrate Notes with existing database resources.

Let's make a deal

Powersoft is expected to announce a similar deal before the end of the year, according to Tom Herring, the firm's vice president of marketing and business development. Informix and Lotus have begun "preliminary conversations" about a partnership, "but nothing has been decided," said Steve Sommer, vice president of marketing at Informix.

Meanwhile, Oracle plans to deliver its own groupware product [CW, Sept. 6]. However, Oracle's approach focuses on integrating enterprisewide applications that span multigigabyte databases. In comparison, Notes is a distributed database aimed at PC end users and currently limited to 1G byte of data.

Larry Ellison, Oracle's chief executive officer, "continues to have discussions" with Lotus CEO Jim Manzi, but the two have yet to hammer out a technology swap, according to Fred Cutler, vice president of business development at Oracle.

For a Notes link to be of use to Oracle customers, the product would have to support on-line transaction processing, Cutler said, adding that Notes and Oracle databases would have to be "substantially integrated, which is more difficult than building a basic gateway between the two products."

New integration

Currently, users can integrate SQL databases with Notes using InfoPump, a batch-oriented data pump tool from Trinzic Corp. in Waltham, Mass.



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- *Aetna Life and Casualty*

"There was no easy way to get critical ticketing information to the PCs on agents' desks."

- *Air France*

SOLUTIONS, SOLUTIONS, SOLUTIONS.

More and more companies are solving their business-critical problems with Microsoft® products and expert advice from its partners. Here are a few solutions:

"Changes that took 10 days now take less than an hour."

Chevron Canada was in a crisis fueled by a 20-year-old system.

The pricing for its orders was being calculated manually, then sent to a mainframe. But when prices were deregulated in 1985, the old system simply overheated.

Chevron formed a task force of technical staff and end users. They developed a client-server system that used Microsoft products like the

Visual Basic™ programming system, SQL Server, LAN Manager, and the Windows NT™ operating system.

These days, accurate pricing information on 300 products can be accessed online by 200 users. Price and tax adjustments can be handled many times faster, and paper-handling costs have been cut in half.

"Now our client's projects can turn on a dime."

Aerospace giant TRW approached NetBase, a Microsoft Solution Provider, to help it manage its projects more efficiently. The problem: Getting project data from the mainframes was expensive and slow.

NetBase used Microsoft Visual

Basic to build a multiuser system with a graphical front end, and the Microsoft FoxPro® database for real-time reporting. The result: Mainframe expenses were cut by 40%, and TRW's profitability is up 20%.

"Schools applied technology to cut administrative costs."

The education division of National Computer Systems (NCS) had been handed a classroom problem: In public school systems around the country, teachers were still managing reports by hand, and losing instruction time.

NCS, a Microsoft Solution Provider, suggested a modular system that uses Microsoft Visual C++™ development system, FORTRAN



PowerStation 16, and FoxPro.

With the new Assure™ assessment system, educators can assess, track, and report student progress against state curricula and outcomes. And it has lowered costs while increasing flexibility in report generation and the tracking of student progress.

So teachers have more time to do what they do best. Teach.

"Now our managers get a unified, consistent view of the enterprise. Instantly."

After a 1992 merger, Chemical Bank's Geoserve Group found itself with multiple computer systems.

Geoserve created harmony by combining the Microsoft Access® database and SQL Server through ODBC, a database access technology, to generate reports based on customer revenue and product data.

Now business information can be accessed directly by managers, who use it to analyze world markets and find the right financial products for the right customers.

"All the information our drafters need for a booklet is now at their fingertips—on a Windows screen."

Aetna produced up to 6,000 booklets a year, each outlining a benefits plan for a different corporate customer. The problem: They used dead-end text processing and document management systems to do it.

The solution was an integrated document management system built around Microsoft Visual C++ and Word for Windows™, plus a front end created with Microsoft Visual Basic.

As a result, Aetna has cut the time required to draft new booklets by more than 115 hours a week, while improving the final product.

"Agents can grab data, work with it, and use it to give customers better service."

In 1992, Air France's ticketing data was in a holding pattern, stuck inside a proprietary database that ran on mid-range equipment.

The airline, in partnership with

MediaServ, a Microsoft Solution Provider, rightsized to a system with Windows NT, SQL Server for Windows NT, Visual Basic, Visual C++, and Microsoft Access.

Now agents can get data easily, and even analyze it on their own. What's more, the system can now be passively maintained by one person, instead of a full-time team of five.

Microsoft At Air France, SOLUTION PROVIDER Aetna, and hundreds of other companies, people are turning to Microsoft to get results like these for line-of-business problems.

They're finding the right tools for any job, no matter how mission-critical. They're also finding complete support for Windows-based application development.

That support includes the Microsoft Solution Providers: a network of thoroughly trained, certified experts who know their clients' businesses inside and out.

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And start turning your company's problems into solutions.



Microsoft
Making it easier

SPARCs fly in Sun's multimedia lineup

By Jean S. Bozman
MOUNTAINVIEW, CALIF.

Sun Microsystems Computer Corp. last week attempted to answer criticism about its spotty multimedia product family with the introduction of three new workstations.

This week, Sun is expected to further

pad its multimedia lineup with ShowMe 2.0, a desktop videoconferencing package that supports real-time video, as well as shared audio and display screens. ShowMe is expected to ship by year's end.

The debut of Sun's workstation trio — SPARCstation 10SX, SPARCstation 10M and SPARCclassic M — will address spe-

cifically two key multimedia shortcomings by offering high-resolution imaging used in desktop publishing and support for real-time video. The company is also offering field upgrades for current workstation users.

Some users who have waited for an integrated Sun videoconferencing solution, such as Ahmad Saadeh, a software

engineer at Loral Space Systems, Inc. in Mountain View, Calif., said they are excited by the idea of upgrading workstations for use with video cameras.

Saadeh said he would like to use Sun workstations as desktop videoconferencing links to overseas offices. But he would prefer to use Solaris 1.X because he does not want to buy a new Solaris 2.X workstation just for video applications. Some video features will require the use of Solaris 2.3, Sun said.

Saadeh said he is also concerned about overall system price, which would include a \$5,000 to \$15,000 workstation. A one-person ShowMe license, which includes a video camera, costs \$3,270, and a three-person ShowMe license is priced at \$8,430.

For its part, Silicon Graphics, Inc. (SGI) said Sun's printed comparisons between the SPARCclassic M and SGI's Indy were unfair. Both units are priced at about \$5,000, but Scott Bonham, SGI's Indy product manager, said Sun appeared to imply that SGI needed additional equipment to support video compression.

Without compression, users' LANs would be swamped by the bandwidth requirements of video transmissions, analysts said. "We integrate video into the base motherboard [of Indy]," Bonham said. "We can do software compression, and we don't need hardware accelerators to do that."

Sun's low-end multimedia workstation targets the SGI Indy but lacks Indy's support for Intel Corp.'s Indio standard and Apple Computer, Inc.'s QuickTime multimedia standard, said Terry Bennett, a Unix analyst at Computer Intelligence/InfoCorp in Santa Clara, Calif.

"Leaving those out really limits the catch for Sun," Bennett said.



RENAISSANCE CS. Now you can really showsize without losing functionality. Our product takes advantage of your open systems, giving your hardware, network, and database environments. And, we really understand your business. We've been a multi-industry powerhouse for years. More than 2,000 organizations rely on Ross Systems for financial, distribution and human resource systems.

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ROSS SYSTEMS
THE LEADER IN MIDDLE RANGE CLIENT/SERVER APPLICATIONS

A look at the list

Sun's multimedia lineup:

- **SPARCclassic M:** Entry-level workstation features a video camera and a real-time video card. Base model has 16M bytes of memory, a 207M-byte drive and a 15-in. color monitor. Cost: \$5,295.
- **SPARCstation 10SX:** It supports 24-bit color, three-dimensional graphics and video. Base model has 32M bytes of memory, a 535M-byte drive and a 16-in. color monitor. Cost: \$15,495.
- **SPARCstation 10M:** It has all features of Model 10SX but adds a video camera and a real-time video card. Cost: \$17,095.
- **Field upgrade policy:** "Multimedia bundles" for all existing SPARCstation models are priced at \$1,895. The bundle includes a small video camera, a video card, video compression and a CD-ROM.

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World readers gave us their coveted Enterprise Technology Award. To top it off, AT&T received top marks for reliability and top marks overall in *Data Communications* Users' Survey.

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It's more than an introduction. It's a revolution. The price/performance leader of UNIX® systems—IBM's RISC System/6000®—has joined forces with the most exciting chip ever created—the new PowerPC 601™—to create the POWERstation™ 250.

The 250 sets a new standard for entry performance—and price/performance. For your business, it means answers at

lightning speed, from accounting to engineering to application development. In fact there are thousands

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complete DCE for advanced client/server solutions. And we've brought technologies like multimedia and object toolkits to the RISC domain. With Wabi™, you'll

run Windows™ applications at blinding speed. Macintosh programs too. And there's more.

We're also launching **POWER2™**, the industry's most powerful RISC technology, in the new POWERserver™ 990—deliver-

ing unprecedented processor performance.

The future will see PowerPC and POWER2 technology in everything from notebooks

to supercomputers. If you're ready for a real change of pace, call us at 1 800 IBM-6676, ext. 669 today.



RISC System/6000

	Price	SPEC™int92	Cost/SPECint92
IBM 25T	\$9,390	62.6	\$150
HP® 715/33	\$9,990	24.7	\$404
DEC™ 300L	\$7,920	45.9	\$173
<hr/>			
IBM 990	\$147,800	126.0	\$1,173
HP 160	\$136,530	82.0	\$1,665
DEC 4000/610	\$131,728	94.6	\$1,392

Power for a new age.

IBM

CIOs brace for health care reform

Clinton health plan will require hospitals and other medical providers to increase their IS budgets

By Allan E. Alter

President Clinton's health care reform plan purports to bring simplicity, savings and streamlining to the U.S. public. But health care chief information officers are finding that instituting health care reform will require complex new information systems, a big increase in IS spending and compliance with regulations overseen by a federal health care bureaucracy.

The result? "We may be talking about doubling the annual IS budget we now have," said Erica L. Drazen, a health care IS consultant and vice president at Arthur D. Little, Inc., a consultancy in Cambridge, Mass. Hospitals typically spend about 2.5% to 3% of their total operating costs on information technology, she noted.

More money, more money

"Our message to our boards of directors is bad news in times of stress — more IS spending, long lead times, technical difficulty," Kerry W. Kissinger, a partner at Ernst & Young in Boston, summarized at a roundtable discussion on health care reform held at a recent conference sponsored by the Ann Arbor, Mich.-based College of Healthcare Information Management Executives (CHIME).

Clinton's proposal [CW, Sept. 6] calls for health care providers to create "electronic documentation of all clinical encounters... using current information systems technology," among other things (see box far right).

Therefore, health care organizations intend to spend a good chunk of cash (see chart above) in the next few years, computerizing patient records and integrating departmental systems such as pharmacy, laboratory and outpatient systems. They also need to share data with other providers, the federal government and the "regional health alliances" that will negotiate with providers under the Clinton plan.

Completing projects of this magnitude has health care CIOs wondering where the funding for these projects will come from. Many said the money would come from cuts in physical expansion. CIOs also expect to look to outsource and share a community health information network with nearby hos-

Up, up and away			
Spending on health care information systems will almost double over the next few years			
MARKET SEGMENTS	1993	1996*	% GROWTH
Acute-care hospitals and their associated in-patient and ambulatory services	\$4.9	\$6.7	37%
Federal government (hospitals and Medicare/Medicaid)	\$1.0	\$1.5	50%
Physician offices/Clinics	\$8	\$1.3	63%
Less acute-care hospitals and other providers	\$8	\$1.5	88%
Total	\$7.5	\$11	47%
	(in billions)	*projected	

Source: Sheldon I. Dorenfest and Associates, Chicago

"Do it [your information technology investments] smartly and you can easily take 15% out of the cost of care," said Erica L. Drazen, health care IS consultant and vice president at Arthur D. Little.

pitals to defray costs.

As the cost concerns mount, some CIOs are already creating budgets and planning new investments to specifically prepare for health care reform.

Harry E. McQueen, CIO of Good Shepherd Medical Center in Longview, Texas, is increasing his IS budget to between \$1.2 million and \$1.5 million in the next three years, up from \$800,000 last year. The additional money will go toward an enterprisewide fiber backbone network and will begin to establish a hospital information system based on open standards.

"This will position us for health care reform so we can be part of



In the majority

Eighty percent of the members of the White House Task Force on Health Care are government employees; only 20% come from the private sector.



communitywide networks and install an enterprisewide patient repository for clinical information," McQueen said. Good Shepherd is a 350-bed medical center that has five outlying clinics and a trauma center.

Grants available

David E. Garets, director of MIS at the 100-bed Magic Valley Regional Medical Center in Twin Falls, Idaho, said he is applying for a National Institutes of Health grant to pay for the development of a prototype rural hospital system. His current annual capital budget is \$300,000, but Garets is budgeting "between \$3.6 million and \$4 million over the next four fiscal years to be able to provide the kind of systems that will put us in compliance" with any likely health care reform. These include systems that will link physicians and payers and measure treatment outcomes.

G. Ward Keever, the senior vice president of information services at the Medical Center of Delaware in Wilmington, said he had just obtained funding to establish a clinical repository that will be available to the center's medical staff over an electronic network by mid-1994. Keever said the repository will eventually be available to providers throughout the region and will include patient eligibility and payment information.

High anxiety

Health care CIOs said they are worried about another clause in the Clinton blueprint. It states: "Current information systems technology readily supports the capture, retention and electronic data interchange of [medical] encounter records as a byproduct of the provision of care and with fa-

Technology care

TO PREPARE THEIR INSTITUTIONS FOR HEALTH CARE REFORM, IS EXECUTIVES WILL NEED TO FOCUS ON THE FOLLOWING EFFORTS, WHICH MAY INCREASE IS COSTS:

- Build systems to record medical procedures, evaluate quality of care and track costs.
- Create computerized patient record systems to record medical histories.
- Report and share data with national health boards, state governments, regional health alliances and others.
- Implement federal standards for EDI, data definitions and data sets.
- Meet federal data security and confidentiality guidelines.
- Integrate information systems throughout the enterprise.

Source: Alan F. Dowling, national partner of health care information services at Ernst & Young

vorable benefit cost efficiencies."

Many CIOs disagreed with this statement, fearing it would create unrealistic expectations among health care chief executive officers, who may wonder why their own IS organization cannot quickly create such systems.

Boon to IS

Despite funding questions, CIOs attending the CHIME conference agreed that health care reform was certain to upgrade the status of IS within the health care industry. "I think this will be a tremendous assist to the IS community," said Larry D. Grandia, vice president of IS at Intermountain Health Care, Inc. in Salt Lake City.

IS executives also point to evidence that shows the payback from these information technology investments far outweighs the cost. "Do it smartly and you can easily take 15% out of the cost of care," Drazen said.

For example, a study conducted at the Wishard Memorial Hospital in Indianapolis found that "a network of [Intel Corp. 80386-based] microcomputer workstations for writing all inpatient orders" that provides cost data to physicians "saved more than \$3 million in charges" at the hospital.

The authors concluded that such systems could potentially save tens of billions of dollars if implemented nationwide. The study was published in the Jan. 20, 1993, issue of the *Journal of the American Medical Association*.

A bounty of bureaucracy

According to a September draft of the president's health care reform proposals, the federal government will establish several oversight organizations and a network of computing centers that will directly affect the health care IS executive. These include the following:

- **The National Health Board:** charged with overseeing the implementation of the health care plan. It will set up a National Quality Management Program to ensure that re-



gional health associations obtain the data they need from providers to evaluate the quality of health care.

- **National Health Data Advisory Council:** charged with specifying data definitions, standard electronic data interchange formats and transfer protocols and other information requirements.

- **A network of regional computing centers** will be created to store as well as analyze the data provided by the health care providers.

—Allan E. Alter

Lotus
1-2-3

Lotus
Ami Pro

Lotus
Approach

Lotus
Freelance
GRAPHICS

Lotus
Organizer



Lotus SMARTSUITE

Five award-winning applications for Windows

BEFORE YOU BUY YOUR WINDOWS APPLICATIONS,
WE SUGGEST YOU GET A FEW QUOTES.

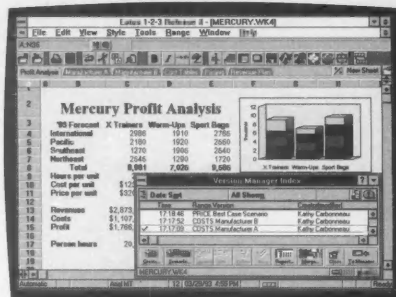
Lotus 1-2-3 Spreadsheet

Thousands of DOS users who wouldn't move to Windows™ for Microsoft® Excel are jumping for Lotus® 1-2-3® Release 4. As are many who already use Windows.

And they're getting a spreadsheet that's not only much easier for them to use, but a lot more powerful in a lot of ways.

The new 1-2-3 is the first spreadsheet designed to help people work the way they want to work. Which is often together.

A raft of powerful new usability features makes 1-2-3 easy to learn and a pleasure to use. These include a context-sensitive user interface. A Live Status Bar. In-Cell™ Editing. One-step charting. A completely new graphical



interface for database queries. And Worksheet Tabs for 3D spreadsheets that make labeling and manipulating the work much easier.

The close integration of 1-2-3 with other Lotus Windows desktop applications lets you easily transfer 1-2-3 information, formats and processes to other applications where you need them. But it's the Version Manager, and other Working Together® features, that turn the 1-2-3 spreadsheet into a potent workgroup tool by letting people share and track information in new ways.

See for yourself. Visit your Lotus Authorized Reseller or call **1-800-TRADEUP, ext. 9080*** to upgrade for just \$119 direct from Lotus. Or ask for a free demo disk. But first, turn the page and let's talk word processors.

Lotus
Working Together

Windows Spreadsheet Ratings

"1-2-3 Release 4.....7.8"
InfoWorld 8/93
"Excel Release 4.0.....6.9"
InfoWorld 10/92
"Quattro Pro Release 1.0.....6.5"
InfoWorld 10/92

"The SmartIcons in 1-2-3 for Windows are smarter and Lotus's approach to swapping different tool-bars in and out beats Excel's and Quattro Pro's."

PC/Computing 6/93

"1-2-3 LEAPFROGS EXCEL AND QUATTRO"

"Lotus's version manager blows away similar features in Excel and Quattro Pro."

Walter S. Mossberg,
Wall Street Journal 7/29/93

-PC World 6/93

"Users who often collaborate on developing and refining worksheet data...will find Release 4 indispensable."

PC Week 5/3/93

"1-2-3 for Windows has always had more powerful database features than Excel or Quattro Pro and now these features are also easier to use."

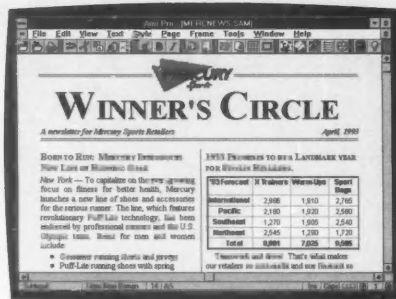
BYTE 6/93

Lotus AMI Pro

Software reviewers and industry experts have convincingly and consistently chosen Lotus® Ami Pro® as the best word processor over both Microsoft® Word and WordPerfect® for Windows™.

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WordPerfect, you'll understand why new Ami Pro users rarely bother to open the manual.

Then consider the advantages of Ami Pro's tight integration with 1-2-3® and the other Lotus applications. With Ami Pro, you can not only exchange data, charts and functions with the other applications in a click, you can easily create hot links between applications.

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"AMI PRO 3.0

"Ami Pro 3.0 comes close to being perfect...It stands above Word and WordPerfect in both its function and in its speed."
Home Office Computing 1/93

"You can learn to use Ami Pro, the Lotus word processing program for Windows, in about a day. Put the manual in a drawer as a first step."
Forbes 2/1/93

TAKES THE LEAD OVER MICROSOFT WORD AS THE WINDOWS WORD PROCESSOR TO BEAT"

"Usability, features, and performance – Ami Pro is the overall winner."
PC/Computing 8/93

"Users moving to Windows from DOS can fearlessly choose the latest Ami Pro version."
PC World 3/93

Lotus FREELANCE GRAPHICS

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Historically, building professional looking presentations, even with the best software, has been time-consuming work. But with Freelance Graphics 2.01, it's so simple and so fast that people are now punching out charts for small presentations and even for hand-outs used at informal meetings.

One click is all it takes to access some of the



most powerful features in Freelance Graphics, like more than 65 SmartMaster™ design sets, 500

symbols and 100 chart styles. And when you're done, you can turn four-color overheads into black and white hand-outs with just one click.

The integration of Freelance Graphics with other Lotus applications is so complete that if you bring your 1-2-3® data into a Freelance presentation, and you later change a number in your 1-2-3 spreadsheet, it will be instantly reflected on the Freelance chart.

For your own live presentation, visit your Lotus Authorized Reseller. Or call **1-800-TRADEUP, ext. 9080*** for a free, full featured working model. By the way, have you ever used a database?

Lotus
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"Creating a presentation of even (100 slides) is absurdly easy --
and much easier in many ways than with competing products..."
PC Week 2/15/93

"Freelance is as close to presentation perfection as
you'll find on any shelf."

Windows User 8/93

"FREELANCE
SCORED AN
AWESOME
98.9 OUT OF
A POSSIBLE
100... POWERPOINT 3.0 SCORED
83.6, HARVARD GRAPHICS 2.0
SCORED 80.4"

- PC / Computing 9/93

"Lotus Freelance Graphics

★★★★★

Microsoft PowerPoint

★★★

Software Digest 7/93

"(Freelance Graphics) outclasses the competition
in features and ease of use."

InfoWorld 6/21/93

"The users in this study were more productive, more
effective, and more satisfied with Freelance Graphics than
PowerPoint... PowerPoint users took 64% more time to
complete their presentations."

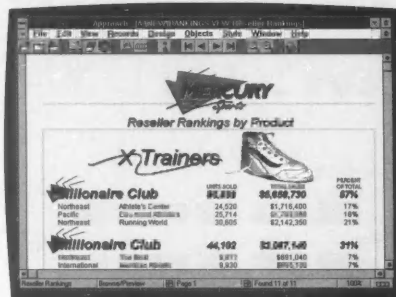
Usability Sciences Corp. 3/93

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Now you, yes you, can build and use your own databases as easily as you build and use your own spreadsheets. For sales reporting, invoicing, project management, customer tracking, mailmerge or hundreds of other uses. Now PC users can enjoy easy, one-click, high-performance access to company data stored in all the major formats (including dBASE®, Paradox®, FoxPro®, Oracle® SQL, SQL



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If you've never worked with a Windows™ database,

or if you bought Paradox or Access™ only to find they were unworkable, Approach will change everything. An independent study found that Approach users are up-to-speed and producing real results in two hours.**

And because Approach is designed to share with other Lotus Windows applications, using Approach databases to mailmerge with Ami Pro,* to share data with 1-2-3* spreadsheets, or to simply report on data is something anyone can do.

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PC Week 6/28/93

"APPROACH... IS BOTH PRODUCTIVE AND HIGHLY USABLE. MICROSOFT ACCESS WILL BE TOO OVERWHELMING FOR END-USERS..."

"...Approach 2.0 is one of the few (software) packages...for which it's truly possible to never open the manuals."^{††}

Windows Magazine 12/92

"Best Buy Approach is the simplest and most straightforward relational database."

PC World 6/93

—InfoWorld 1/17/93

"The most usable Windows relational database ever."
PC/Computing 8/93

Lotus SMARTSUITE™

Five award-winning applications in one

The new Lotus® SmartSuite™ 2.1 is the most complete desktop solution for Windows™ users. It brings together 1-2-3® Release 4, Ami Pro® Release 3.01, Freelance Graphics® Release 2.01, Approach™ 2.1 and Organizer™ 1.1 at an irresistible price (upgrade for just \$299***). But it's much more than a deal on an all-star collection of Windows applications.

The applications in SmartSuite 2.1 are closely integrated, sharing a consistent appearance and behavior. This reduces the time it takes for a user to learn each application. For example, the three most used applications in SmartSuite share 26 common SmartIcons® (In Microsoft® Office, they share 3).

Far beyond anything possible with Microsoft Office, Lotus's integration also simplifies the process of

switching between applications, sharing information across applications and using functions from one application while working within another.

For example, you can easily edit 1-2-3 charts from within Freelance Graphics. Or use Freelance, or 1-2-3 functions within Ami Pro. All work easily with the Approach database. And all support industry standards, so they'll work with offerings from other vendors as well. This makes working in each application, and the entire Windows platform, easier and more productive than ever before.

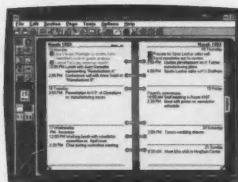
SmartSuite is also designed for working in groups in ways Microsoft Office can't. All applications are

network ready and mail-enabled with ccMail™. The results of Working Together® are easily manageable through 1-2-3's Version Manager. And each application features additional enhancements for full integration with Lotus Notes.***

Unlike Office users, SmartSuite users can call a single toll-free number for support.

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for a SmartSuite demo disk, call **1-800-TRADEUP, ext. 9080***



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*Soft*Letter 5/21/93*

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PC/Computing 8/93

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Dataquest 6/15/93

—PC Letter 6/7/93

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'Friends, Romans...'

In *Julius Caesar*, Shakespeare noted: "The evil that men do lives after them. The good is oft interred with their bones."

This may not be the best quote to use when talking about John Sculley, as he is neither dead nor even departed from the industry (witness the fun we're having at his expense in the cartoon at right). But since Sculley stepped down from the top post at Apple earlier this month, about the only place you could read of his unique accomplishments was in the press release issued by Apple. Otherwise, he's been roundly castigated for a variety of managerial offenses.

So let's take note here of some of his accomplishments. First and foremost, Apple was a bit player in the business market when Sculley arrived at the company. Today, it is the only PC company that has had significant success in the home, educational and small and large business markets.

In 1992, Sculley's last full year at the helm, Apple sold more PCs than any other company in the world—10% more than the No. 2 company, IBM, and 125% more than Compaq, the No. 3 company.

By engineering a partnership with Motorola and IBM to produce the PowerPC microprocessor, Sculley attempted to give Apple a path away from the Macintosh line, which had made the company so successful in the past decade, but whose end was in sight.

These accomplishments, meanwhile, took place while Sculley skillfully imbued Apple with a culture far different than the one he inherited from company founder Steve Jobs. And if you think this is easy, ask IBM's Louis Gerstner or Digital's Robert Palmer about culture and how tough it is to change.

Ultimately, if Sculley was guilty of anything, it was the same human frailty that has afflicted countless other industry executives and also struck so many IS managers along the way. It goes like this:

An executive defines a strategy and the company gains success, perhaps great success. Then the underlying fundamentals that made the company successful start to shift, sending out low-frequency signals to that effect. But past successes cause even the brightest executives to turn a deaf ear to those signals, even to reject them outright.

At Apple, as at Compaq under Rod Canion, the commoditization PC hardware ran counter to what had made the company so successful. Therefore, it was rejected as a strategy, just as the decentralization of the highly structured glass house of MIS/data processing was so antithetical to IS managers in the late 1980s.

One could attack Sculley for being profoundly human. But that certainly does not demean a legacy that saw him guide Apple into the realm of world-class corporations.

Bill Laberis

Bill Laberis, Editor in chief



Peer-to-peer payoff

Art Olbert of IBM should reconsider his thoughts on peer-to-peer networks [CW, Sept. 13]. The current annual sales in that section of the LAN marketplace are more than \$200 million and by 1996 should reach at least \$1 billion.

Currently, more than 50% of all networks contain fewer than 10 workstations; estimates suggest that this percentage will not change through the end of the century, even though network sales will expand dramatically.

Richard F. Clowes
New York City

Nothing to cheer

Where is the data to support the glowing statements you printed about women's progress being responsible for the shrinkage in the gender gap for pay ["Women cheer salary gap news," CW, Sept. 13]? I suspect much of the change parallels the general economy.

Large numbers of men lost high-wage jobs and couldn't find high-wage replacement jobs, switching to low wages in the service sector instead. This is the primary factor in the recent pay disparity shrinkage for the general population.

The same pattern might easily be true for computing professionals. If this is why our pay disparity is shrinking, I don't consider it progress.

Bonnie Huval
Houston

Contractors sound off on competition, clients and costs

Regarding "Who's a contractor? IRS cracks down" [CW, Sept. 27]: It is not illegal to be an independent contractor! We are issued 1099s, and they are cross-checked by the IRS.

Many companies welcome independents to compete along with brokers and agencies for contracts. Most of my clients prefer to deal directly with the person who is doing the work, rather than with someone who is a full-time marketing person adept at flinging buzzwords at them.

Anthony Melodia
Independent consultant
San Francisco

Your article regarding computer contractors does a great injustice to all independent consultants who are fighting often corrupt agencies for clients. Agencies and brokers take great delight in scaring clients into not using the services of an independent consultant.

There are scads of tax-problem cases in which agents have tried to place independents on a 1099 basis with clients in direct violation of Section 1706 of the tax code.

Because independent consultants can (and do) underbid the large agencies, the agencies attempt to neutralize the competitive environment by scaring clients into not signing directly with an independent by claiming the client might face tax consequences.

Thus the client company pays

20% to 30% more for the same services it could get by working with a consultant directly. It is an interesting story the brokers tell convincingly.

Alan N. Canton
Vice president
Adams-Blake Publishing
Fair Oaks, Calif.

Shame on *Computerworld* for giving voice to those who denigrate independent contractors. The "groupthink" mentality that says "Hire contractors only through contracting agencies, which are responsible for paying taxes" implies that independent contractors will cheat if given half a chance.

Bureaucrats like Tom Charbonneau have helped to destroy many small businesses. Worse, they defeat themselves by not considering some of the best independent contractors who refuse to give 30% of their income to a brokerage firm that provides no value to the customer.

Richard A. Menard
Framingham, Mass.



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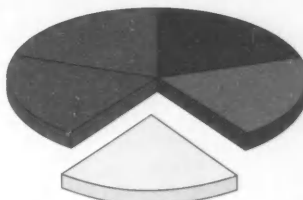
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- ☐ Unix (d)
- App. Development Tools
- ☐ CASE (h)
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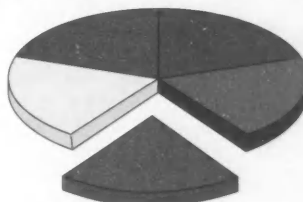
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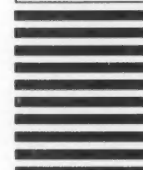
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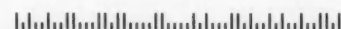
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Viewpoint

Don't wait to be asked

By Dennis Jones

What do customers want? It's a simple question, but difficult to answer successfully. The real problem is that most businesses today can't wait for customers to realize what it is they want, and that's just as true for the information technology function as it is for business as a whole. Customers may not even realize they have a problem or a need until it's too late for an acceptable response.

Knowing what your customers need before they have time to think about it is a powerful strategy in today's market.

At Federal Express, we've made it the driving strategy of our business and our technology team. Along the way, we've discovered some guiding principles:

• Responsiveness is not enough. The traditional interpretation of the information technologist's role is that we respond to users' requests and aim to fulfill their expressed needs. This is an outdated idea. We can't sit back and wait for requests. We have to get up, get out and learn so much about our customers' jobs that we are able to see and suggest opportunities for improvement even before they do.

This is done by working with end users as they close their books, make sales calls, sort packages. During peak work periods, informa-

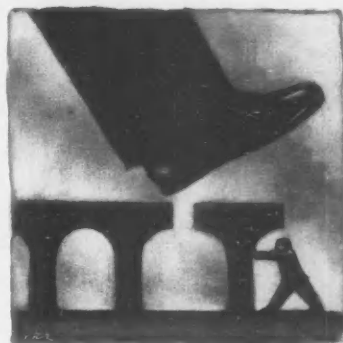
tion technology personnel don't just observe but actually perform the work. There's no better way to get to know the ins and outs of a process than to take an active part in it.

• All information technology activities must have a business purpose. Our rule is that there are only three good reasons to undertake an information technology project: to reduce cost, to improve the quality of the company's product and to increase market share. Some projects — such as our Powership network of PCs at customer sites — can achieve all three, and those triple-crown types are obviously the ones we most like to find. But the main objective is never to deploy technology just for technology's sake.

• It's imperative to eliminate sources of time and paper. Needless cycle time and paper are always sources of waste; eliminating them is a surefire way to "delight" customers. Getting to this point often requires a pitched battle, however, because feildoms are constructed around prerogatives such as taking time and passing paper.

• Client/server is inevitable, and we can either lead the transition or get out of the way. Whether those in the information technology function like it or not, our users are quickly moving us out of the glass house. We have a basic choice: We can either cannibalize

We can either cannibalize our own architectures and operations or let our successors have that opportunity.



our own information services architectures and operations or let our successors have that opportunity.

The graphical and information sharing capabilities of client/server environments are too enormous to delay delivering them to users. The text-based, data processing model has served business well, but it is quickly reaching the end of its useful life.

Jones is chief information officer at Federal Express Corp. in Memphis. Federal Express was recently included, for the sixth time, in *Computerworld's* Premier 100, a group of companies that are judged as particularly effective in their use of information technology. Jones was also named the Lattanz Center Information Executive of the Year for 1993.

The perfect trap

Many businesses owe their current prosperity to imperfections in the marketplace. Soon there may be few places to hide.

By Max D. Hopper

There's no shortage of expressions to describe the tremendous pressures on business in the 1990s. Some of them are even printable. Economists who contemplate the tides of commerce from the comfort of their tenured university chairs can take lofty positions. Some of these are even pertinent.

In the 1940s, Harvard economist Joseph Schumpeter coined the term *creative destruction* to describe the constant mutation of the economic structure: the incessant destruction of the old order and the unceasing creation of a new one. Schumpeter held that creative destruction is driven by the emergence of some new factor — technology, commodity or source of supply — that commands a decisive cost or quality advantage. The introduction of such a catalyst, he said, strikes at the very foundations of existing enterprises.

Today, information technology is that catalyst. It is both the destroyer of the status quo and the enabler of those enterprises that employ it astutely. We see an agile new breed of retailers using the blitzkrieg efficiencies of information technology in inventory deployment to unseat the sedentary giants of their indus-

try. We see service businesses surpassing regimented rivals by arming front-line employees with the information to serve customers more effectively. Indeed, the most-aggressive efforts in this arena place the tools in the hands of customers themselves. Like most catalysts, however, technology is volatile and can produce unexpected consequences.

It is becoming clear, for example, that it may be possible to provide customers with too much information for an industry's own good. When all buyers and sellers of essentially commodity products and services have complete access to the prices being asked across the market, you have a condition called *perfect pricing*. You also have a key attribute of another classic concept of economics long thought to be unattainable in the real world: the ominous ideal of *perfect competition*.

If the ravages of perfect competition exist anywhere today, they are reflected in the beleaguered airline industry, where dozens of carriers vie for cost-conscious customers who largely view an airline seat as a commodity item. Here, perfect pricing information is en-

abled by computerized reservation systems that allow travelers to instantly compare all competing fares on any route. Although the resultant fare wars may strike some travelers as too good to be true, the airlines that are subsidizing this buyers' market with their would-be profits find it too true to be good.

The glaring visibility that computerized reservation systems have brought to airline pricing may presage a trend toward perfect pricing information in other industries. The financial world is moving in that direction, with buyers and traders having up-to-the-minute information on commodities and currency. While it is possible to offset fierce price competition with differentiating factors, such as quality, service



and convenience, many businesses owe their prosperity to imperfections in the marketplace. As widespread access to information exposes these niches, there will be fewer places to hide.

Hopper is chairman of AMR Corp.'s Sabre Technology Group.

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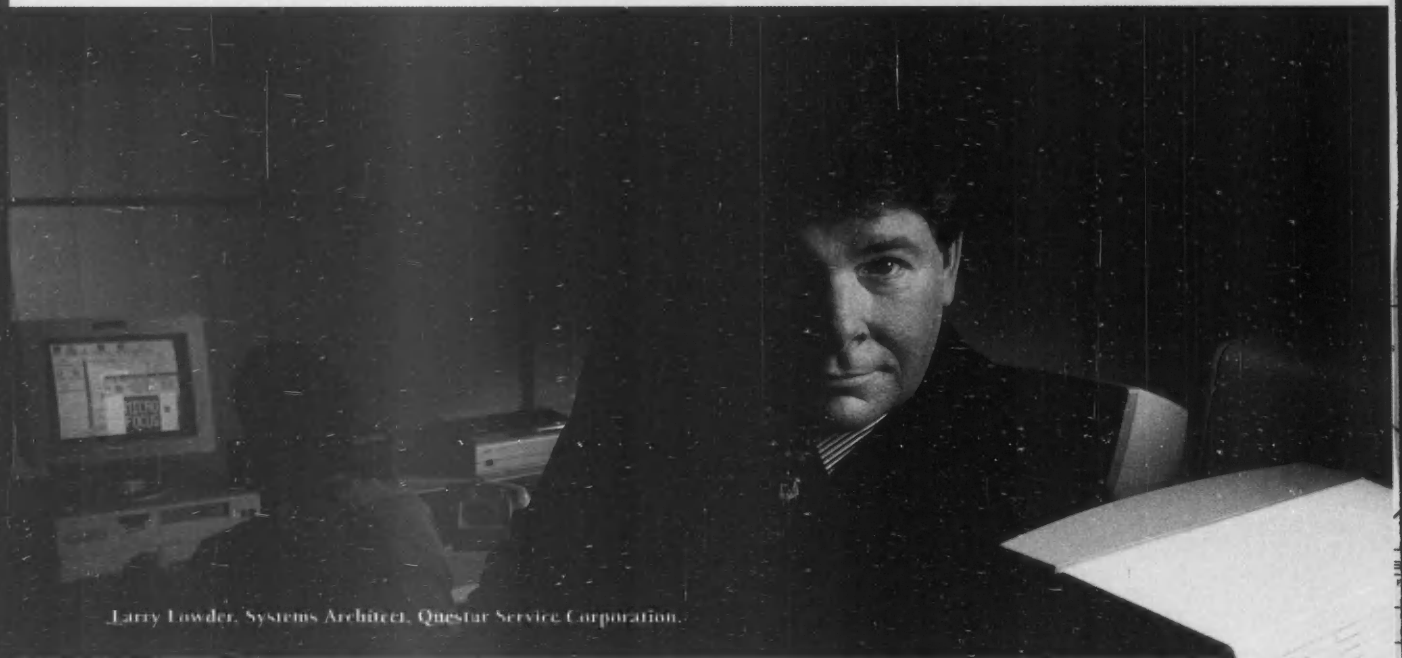
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“We were told it was impossible to develop a client/server application without extensive retraining. Then we talked to Micro Focus.”



Larry Lowder, Systems Architect, Questar Service Corporation.

Mountain Fuel Supply®, a division of Questar®, is a utility company supplying natural gas to 750,000 customers across Utah, Wyoming, Idaho and Colorado. The company's success is largely driven by its implicit belief that the customer is number one.

Yet, IT also plays its part in that success: client/server architectures and graphical user interfaces (GUIs) have helped Mountain Fuel Supply move applications and information closer to the customers and the employees. All of which has resulted in an augmented level of service being offered to customers.

When Larry Lowder, one of Questar's

Systems Architects, set out to build the client/server architecture for Mountain Fuel Supply, he needed solutions, not skepticism. For the first project, a cashiering system, he needed to link workstations with OS/2® to the DB2® database on the host, running CICS®.

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Desktop Computing

David Coursey

Suite deals



I've just finished testing both WordPerfect 6.0 and Microsoft's Word for Windows 6.0, and I think I like WordPer-

fect best.

But there's a good chance I won't use it.

The issue isn't file compatibility. We are already slinging a variety of file formats around the LAN and use both Windows and Macintosh. No matter what I do—upgrade the Winword I'm using today or make the switch—I will still be saving files in some sort of a common denominator format until everyone else catches up. No big deal.

The real obstacle to following personal preference in this case is that WordPerfect is a stand-alone application. WordPerfect and its partner, Borland, won't weigh in with a real integrated suite until next spring. I think there's a reasonable possibility they will catch up all at once, but we won't know that until after the last frost.

In the meantime, WordPerfect does include nice spreadsheet and graphics capabilities, but the quality of an individual application isn't the point anymore. Integration is. For better or worse (and it's likely there'll be a lot of that), software suites are the way we're all headed.

Patchwork buying

It used to be our desktops were a patchwork of our software packages. The best choice from the spreadsheet column, the best word processor and a bunch of apps, like communications or graphics, that few outside our immediate workgroup would care about. How well these applications worked together didn't matter much once we got over the major hurdle of file sharing.

Today, the "best of breed" approach has been replaced with a new concept: What you do isn't as important as who you do it with. Call this the social climber school of software thought. It says that

Coursey, page 46

Intel fixing PCI bugs

Level of openness still questioned by analysts

By Michael Fitzgerald
SANTA CLARA, CALIF.

■ Intel Corp.'s proposed new Peripheral Component Interconnect (PCI) local-bus standard has surprisingly big question marks next to its name for a bus with support from more than 200 vendors.

The questions center on the usual industry issues: bugs and the efficacy of vendor alliances.

Intel recently had to acknowledge bugs in the way PCI works with some implementations of Pentium systems. In a box that combines PCI, the Extended Industry Standard Architecture (EISA) bus and write-back cache, a Pentium chip will run software some 15% slower than it should. Two large vendors, Dell Computer Corp. and Gateway 2000, Inc., said they would delay some systems shipments for a month until the bugs were clearly fixed.

Minor Issues

The issue may be a small one for users, given the slight delay in ship dates and the actual demand for EISA-bus machines, and, for that matter, Pentium systems themselves.

"Most people are using [AT] buses, and those chip sets are in very good shape," said Albert Y. C. Yu, Intel's senior vice president and general manager of the microprocessor products group. Yu said Intel has "fixed the problem, and is sampling chip sets to our customers, and they've said it looks pretty good."

Yu predicted Pentium-and-EISA system

shipments in November.

As if to underscore the real lack of impact this will have in the market, IBM PC Co. last week announced an AT-bus-based PCI/Pentium combo in its new ValuePoint line [CW, Oct. 18]. PC Co. officials said they have no problems with bugs.

The ominous question, analysts said, revolves around the level of openness Intel will give PCI. Intel worked to establish a PCI Special Interest Group (SIG), throwing in documentation on its three major patents related to PCI. Since then, the group, which has nine committee members and some 200 other members, has developed a new 64-bit standard for PCI.

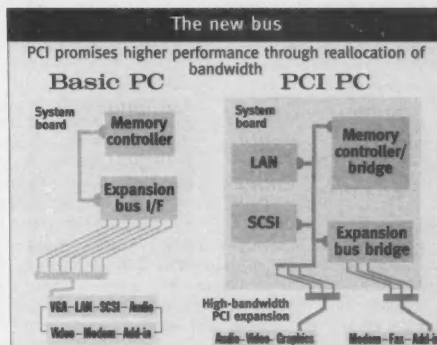
"A lot of manufacturers have this sort of paranoia that if they buy into PCI, the pay-back reaper will come in later and say 'pay up!'" said Bruce Stephen, director of PC hardware and pricing research at International Data Corp. in Framingham, Mass. Stephen said "everyone seems to agree that it's a superior technology, but what's the real cost to Intel?"

Giving up control

The fear for users would be higher costs for add-in cards and giving control of the bus to one vendor. Manufacturer paranoia was heightened by Intel's decision last year to

sue a Taiwanese clone maker, Twinhead International Corp., for using non-Intel chips in a machine that shipped bundled with Windows. Intel's weapon here was its patent addressing the way a machine shipped with Windows boots up.

Members of the PCI SIG include Digital Equipment Corp., which has built PCI support into its Alpha processor, Apple Computer, Inc., which is wedded to the PowerPC



architecture, and Advanced Micro Devices, Inc.

"It's a pop-up patent, and that's what they are doing again," said Kimball Brown, an analyst at Computer Intelligence/Info-Corp in Santa Clara, Calif.

Intel officials bristled at the idea that the company might not be serious about making PCI open.

"We've agreed to license on an open and royalty-free basis [our] intellectual property. We have documented that, and that documentation and agreement has been issued to every registered holder of a PCI spec," said Ron Smith, general manager of Intel fixes, page 50

Data infrastructures

Software may clear some hurdles on data highway

By Michael Vizard
CAMBRIDGE, MASS.

With more than \$30 billion expected to be spent on the construction of a national data highway, some of the luminaries of the computer science world gathered here at MIT last week in an effort to highlight the major research challenges involved in creating a national data infrastructure.

Probably the most pressing issue is a lack of intelligent software capable of taking advantage of such an infrastructure.

Speaking at the Society of

Minds symposium sponsored by The Media Laboratory at MIT, most researchers concurred that while the elements to build an infrastructure for a national data highway are in place, it will still be years before researchers develop software that is sophisticated enough to turn the dreams that such highways invoke into a reality.

Most of the \$30 billion that will be spent in the coming

years will be focused on creating a fiber-optic network and linking homes and businesses to that network, which will then serve as the functional equivalent of a Route 66 highway, providing an infrastructure for speeding the transfer of data by creating more direct links between sites.

The challenge is turning that highway into a more effective tool for sending information other than basic mail messages.

The bulk of the allocated money will go toward creating a fiber-optic network.

"Right now, the Internet is the duck tape glueing together the infrastructure," said Michael Hawley, an MIT assistant professor of media arts and sciences.

Many goals to meet

In particular, an effective national data highway is going to require significantly faster switches capable of supporting voice, data and video simultaneously and a wide variety of intelligent software agents that can find and gather information strewn across any number of systems attached to the network.

To accomplish these goals, software vendors are looking to create agents using some of the principles first established in the artificial intelligence domain, while hardware vendors

Data highway, page 46

Mac users waiting for PowerPCs

By James Daly

Some longtime fans of Apple Computer, Inc. are putting off buying new Macintosh PCs and are squirreling away their money while waiting for machines based on the impending PowerPC RISC chip. But most said they will spend those stockpiled funds only if the new models come in at the right price.

"If they cost anything over \$2,500, they're just whistling Dixie," said Mike Bailey, a systems integrator at Lockheed Missiles and Space Co. in Sunnyvale, Calif. Bailey said his company intends to use the PowerPC Macintoshes as high-end workstation.

"But if they come in too pricey, then I'll have to re-evaluate. Heck, I could buy a [Intel Corp.] Pentium," Bailey said.

In January, Apple is expected to announce several models based on the PowerPC 601 chip, which is a collaborative effort among Apple, IBM and Motorola, Inc. Several models employing the new chip are expected to ship by March.

While the momentous announcements have some information systems man-

agers rethinking autumn purchasing plans, they have also generated a nail-biting uncertainty. Some interviewed recently wondered whether the PowerPC will render their current Macintoshes obsolete. Others were confused about the upgrade path to the PowerPC.

Upgrades on the way

Apple spokeswoman Betty Taylor said the firm intends to provide PowerPC upgrades for the 68040-based Macintoshes, including the Macintosh Centris 610, 650 and 660AV; Macintosh IIfx and IIfx; Performa 600; and Quadra 800 and 840AV systems.

Apple also announced last week that it would offer a PowerPC upgrade for all three models of its Workgroup Server line.

If you have Quadras of the 700, 900 or 950 variety you are also in luck: DayStar Digital has said it will make upgrade cards for these Macintoshes. Taylor said Apple is working with other third-party developers to create upgrade paths for other models as well.

That news has altered some buying patterns. "We're only buying the upgrade-able Macintoshes," said Brian Connes,

manager of the information center at DHL Airways, Inc. in Redwood City, Calif. "We're not going to shortchange the folks who need new machines now, but we've got to make plans for the future."

Upgrade prices will vary by model, but they are expected to start at less than \$1,000. Prices will be finalized by the time PowerPC Macintosh products are announced in January, Taylor said.

For those who do not need the power of the new RISC chip, fear not. Apple will continue to offer 680X0-based systems well after the initial introduction of Macintosh on PowerPC, Taylor said. In addition, software that runs on today's Macintoshes will also run on the PowerPC machines. "Apple's chief goal is to retain a high degree of compatibility with existing Macintosh applications," she said.

Meanwhile, Apple is also optimizing parts of System 7 to achieve better performance on the PowerPC processors. For example, many Macintosh applications spend most of their time calling procedures from the Macintosh Toolbox, a set of system software modules designed to handle common tasks. Apple has modified the Toolbox procedures that take the most computation power (such as QuickDraw routines for on-screen graphics) to take advantage of RISC.

What's in store

The PowerPC microprocessor family looks like this:

- **PowerPC 601:** Will be used in initial midrange and high-end Macintosh systems. Availability: early 1994.
- **PowerPC 603:** Designed for high-volume desktop Macintoshes, as well as portable PowerBook and Duo models. Also suited for embedded controller applications. Offers performance similar to the 601 in a lower-power, lower-cost design. Availability: mid-1994.
- **PowerPC 604:** Will eventually replace the 601, allowing better performance in midrange and high-end Macintoshes. Availability: late 1994.
- **PowerPC 620:** Intended for high-end products, it offers premium performance and a full 64-bit architecture. Designed primarily for high-performance workstations and servers. Availability: late 1994 to early 1995.

Coursey

CONTINUED FROM PAGE 45

software integration now matters more than what software you are running.

Suites are what's happening, and we can't avoid them. This is

good for cross-application integration and seems to be good for pricing, but it has a dark side as well.

Suites encourage people to buy applications they don't need and install them companywide. This raises training, support and upgrade costs.

Worse, suites are headed down the road toward making the Windows user interface more and more proprietary. A function that has been made really simple in one suite is likely to require many more keystrokes and mouse clicks in another. Or if there is a comparable shortcut in two packages, the user can count on them being implemented in different ways.

As a result, a user who spends his or her day in Lotus SmartSuite

could have some real problems moving to a Microsoft or WordPerfect/Borland package.

Right now, many companies are purchasing the packages and then spreading the components across multiple desktops — a spreadsheet here, a word processor there. The software publishers are, predictably aghast at this,

sometimes claiming the license agreements prohibit splitting up the packages. If they get really serious about locking customers in, there's an easy way for them to do it. All they need to do is create high-end integrated packages in which the applications are inseparable, just as they already do with their \$99 "works" packages.

If that happens — and I think it's likely — we may soon come to think of suites as single, tightly integrated "hyperapplications" instead of collections of stand-alone pieces. I'm not sure that will be in anyone's best interest.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCI Mail address is 558-4460.

Data highway hurdles

CONTINUED FROM PAGE 45

are looking to incorporate some of the principles associated with biological systems in their systems. Once these are concocted, researchers will have to focus on linking personal devices — Apple Computer, Inc.'s Newton could be considered a forerunner — back to network resources.

"We need to evolve ways of searching and filtering information. This will give rise to the use of intelligent systems. There is no other way to deal with the infrastructure," Hawley said.

Already, users are seeing the first rudimentary implementations of agents. For example, Microsoft Corp.'s latest software offering includes a number of agents that automate tasks, and a small number of agents, called Knowbots, are available for searching for text across the Internet.

Independent agents

The long-term goal, however, will be to make these agents less dependent on preprogrammed rules. Instead, users will see a new generation of intelligent agents that will

be capable of learning by example.

For example, an agent might learn by monitoring your interaction with a system that information regarding the performance of the New York Giants football team is important to you every Sunday night.

It will then automatically scan all available resources and collate that data for your perusal prior to your logging into the system on a Sunday night.

To accomplish this, programmers will have to eventually give up their traditional programming and debugging methodologies in favor of treating a machine like a child that is capable of learning by example, argued Marvin Minsky, founder of the artificial intelligence laboratory at MIT.

The major stumbling block in this area, however, is that in trying to replicate how humans think, programmers do not yet have the tools available to accurately emulate the hu-

man mind's ability to organize related data and to represent that data by multiple symbols, noted Kenneth Haase, an MIT assistant professor of media arts and sciences.

Longtime coming

Meanwhile, hardware vendors have discovered that it would probably take decades

to build systems using conventional processors capable of supporting the switching and sorting algorithms necessary to create a data highway that would be shared by millions of users.

However, some hardware vendors are investigating borrowing concepts from the theories of evolution and natural selection to create highly efficient sorting engines, said Danny Hillis, a founding scientist at Thinking Machines Corp. in Cambridge, Mass.

Hillis said since current engineering methods are not practical for making a truly thinking machine, he is investigating how the human mind sorts images and data in the hopes of applying that knowledge on a larger scale.

An effective national data highway is going to require significantly faster switches that are capable of supporting voice, video and data simultaneously.



Hewlett-Packard servers and INGRES software help **PBS** bring Sesame Street to Main Street. Faster, more accurately and on a tight IT budget.

"It's the ideal system environment for running complicated, mission-critical broadcast applications with high reliability."

— Frank Pellegrino, Associate Director,
Computer Services, Public Broadcasting Service

PBS has 346 member stations, scattered across seven time zones. They all have widely varied broadcast schedules, requiring continuous transmission of programs from PBS headquarters in Alexandria, Virginia.


The speed, accuracy and reliability demanded for this task was proving too much for their old computer system. So, after carefully checking out the leading suppliers, PBS chose HP 9000 servers as the hosts for the INGRES database management software.

This approach allowed PBS to run their programming and library applications faster. And HP's Open Systems environment meant they could integrate existing client hardware. And save scarce IT funds.

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Paul Gillin

Portable pleasures



Portable PC users today can pretty much agree on one thing: They want a computer that fits on an airplane tray and lasts for a complete flight from San Francisco to New York. Unfortunately,

no computer I've used has yet met that challenge, but a couple of recent entrants take pretty good shots.

The IBM ThinkPad 350C color notebook is where the IBM PC Co. wants to steer the legions of users who can't get the elegant 750C, which has been plagued by supply problems. Sporting a 486SL chip, passive-matrix color display, a 125M-byte hard disk and 4M bytes of main memory in a 5.2-pound package about the size of a high school textbook, the \$1,999 350C is hard to beat. It should be on the short list of anyone who wants color portable computing on a budget.

The 350C's display is crisp and surprisingly responsive for a passive-matrix model. I didn't encounter any lighting condition that made it difficult to read. The keyboard is a bit cramped but workable. The best feature of the machine—and all IBM ThinkPads—is the TrackPoint II, an ingenious little mouse control that works by finger pressure alone.

It takes a little getting used to, but once you get the hang of it, the TrackPoint is the most convenient, best designed mouse controller on the market.

The ThinkPad has a few other nice features. A software power management configuration utility is accessible with a two-key combination at any time from within any program. The feature lets you instantly customize power-management features to get the mix of battery life and performance you desire. A 3½-in. diskette drive is conveniently built into the unit.

IBM claims that the ThinkPad 350C gets up to 9.3 hours of battery life "depending on usage," which probably means sitting quietly on a shelf. Battery life is a disappointing 2 to 2½ hours at best. What's worse is when the ThinkPad's battery gets low, the unit beeps and flashes every few seconds. It can do this for an hour or more, making for great relations with your airline seatmates. IBM should make the ThinkPad's low-battery reminder less aggressive in the future.

Now for something else...

Dauphin Technology presents an entirely different bid for the traveler's wallet with its DTR-1, an intriguing little handheld device that explores new dimensions in miniaturization. Lombard, Ill.-based Dauphin is aiming the DTR-1 at business users who want an elegant, compact, touch-typable portable computer and who occasionally need to accommodate pen input.

Priced at \$2,495, the DTR-1 has many innovative design features, including an internal fax/modem and optional internal Ethernet. The DTR-1 comes equipped for use as a pen computer or an ultracompact portable. The unit is in two pieces: a pen-ready 9-by 5½-by 1½-in. deep base unit with built-in VGA display and

a separate keyboard.

You can run DOS, Windows or Microsoft's Windows for Pen Computing, using the unit either as a very small notebook computer or a largish handheld system. The system unit and keyboard are strapped into a leather billfold that zips shut like a traveling toilet kit.

The best part of the DTR-1 is its brilliant little screen. The backlit LCD is



The Dauphin DTR-1 packs an internal fax/modem and optional internal Ethernet card into a 2½-pound package

bright enough to read in any lighting situation. Battery life is an unspectacular two to three hours.

Unfortunately, in trying to do two things at once, the DTR-1 succeeds in doing neither particularly well. Windows for Pen Computing is a poor choice of operating environment, in part because Windows doesn't translate well to a pen interface and in part because its primitive handwriting recognition renders it almost useless for serious notetaking.

Also, the DTR-1 is just big enough to be inconvenient as a handheld system. A serious pen user would want something smaller or flatter. The keyboard isn't up to the quality of most notebook alterna-

tives and the key spacing was a bit cramped for my long fingers. The leather case has an elegant but flimsy feel and the lack of a hard shell case may be disquieting to the traveler who is used to heaping abuse on a portable system. The DTR-1 comes with a skimpy 20M-byte hard drive. These days, that's barely enough to hold Windows and one or two applications. Serious users will quickly

run out of space.

The DTR-1 is in many ways a breakthrough in portability, one that could find a following among over-laden business travelers. But as a general-purpose notebook, it's a couple of megabytes short.

Fax to the max

If you're in the market for fax software, run, don't walk, to buy FaxWorks Pro 3.0 from Atlanta-based SoftNet, Inc. This is

what fax software should be. It not only supports just about any fax modem under the sun, but its interface is slick, intuitive and fast. In two months of using FaxWorks, I have yet to crack the cover on the manual. Among its many nice features are automatic cover page generation. FaxWorks Pro's image manipulation and page rotation is the fastest I've seen. If you're a Delrina Technology WinFax Pro user, it will blow you away.

SoftNet has taken the pain out of using a fax modem. This is certainly a great product.

Gillin is *Computerworld's* executive editor. His MCI Mail address is 575-4120.

Firm pioneers software for annuities

Mutual fund company deploys user-developed tool to explain investments

By Mitch Betts
WASHINGTON

Some of today's financial investment vehicles are so complex that even brokers cannot grasp all of their features, let alone explain them to most of us.

That is certainly the case with "variable annuities," so one leading financial firm is deploying laptop PC software that uses presentation graphics to explain and sell customers on its version of a variable annuity.

The first-of-its-kind software was developed by Calvert Group, a mutual fund management company based in the Washington suburb of Bethesda, Md. In fact, the notion of using computer software to explain an investment product is so new that Calvert had to get approval from the National Association of Securities Dealers (NASD) in Washington.

NASD had to review the text and illustrations to ensure that they provide the same disclaimers, caveats and "fine

print" as a paper prospectus so the software doesn't bamboozle customers.

"They wanted a lot of proof that we calculated the illustrations correctly," said William R. Chambers, director of business and product development at Calvert, a subsidiary of Acacia Mutual Life Insurance Co. in Washington.

"They had never reviewed a software product before," Chambers said, "so instead of the usual 10-day review period, it took two months."

Variable annuities are a hot investment product for baby boomers facing middle age and higher income taxes. They combine the investment potential of mutual funds with the tax-deferral attributes of insurance, but the features and options are very hard to explain.

So Calvert holds training seminars on the Calvert Prism Variable Annuity for

investment brokers and then hands out (at no charge) the software to help them understand, explain and sell the product. The software allows the broker to fill in data for prospective clients and then show customized graphs that illustrate how the investment might look in their retirement years.

By the end of 1993, Calvert expects to have handed out 5,000 copies of the Prism Edge software to independent financial advisers, Chambers said.

In addition to being a sales tool, he said the software ensures that brokers in the field provide accurate and consistent information about the investment product.

Module compatibility

The software has modules for client management, competing products, calculations and printing out forms and con-

tracts. Programming was done by Maytech, Inc., a small software development firm in Lenexa, Kan.

The laptop software may give Calvert a competitive edge for a while, but Chambers said he expects other firms will soon use the same technique for educating people about complex financial products.

Consumer reaction has been favorable, Chambers said, because the software presentation uses a customer's actual financial data for making retirement decisions rather than a generic illustration of some "average" person's finances.

"Presentations with flip charts and three-ring binders err on the side of simplicity," said Dale E. Cooper, director of retail marketing at Capital Holding Corp. in Louisville, Ky., which handles the insurance side of the Calvert product.

The software will be updated every six months in order to reflect any changes that might occur in tax law, stock performance and the features of competing products.

Calvert Group needed approval from the National Association of Securities Dealers to market its annuity software.



Hewlett-Packard and Informix help the Midwest Securities Trust Company handle customer inquiries in a tenth of the time. And at a twentieth of the cost.

"I don't think I could have done it with any other vendor than HP."

— Donald S. Elko, CIO for the Midwest Securities Trust Company, a subsidiary of The Chicago Stock Exchange

Their customers were having to wait over two weeks for critical information about trades and dividends. Trying to fix the problem with a new mainframe application would have taken about a year, a lot of programmers and a ton of money.

Instead the Midwest Securities Trust Company turned to HP's UNIX[®]-based client/server technology, the #1 platform for Informix's relational database management software.

"We were able to complete the system within three months, using one developer," Donald S. Elko said. "It provides responses nearly ten times faster than the mainframe. They're online, real-time rather than paper-based. And the HP 9000 system only cost us a fraction of what we spent on our last mainframe upgrade."

To help your company make the technology exchange, call 1-800-637-7740, Ext. 7874 for more information. The ROI alone could be much greater than you think.



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Can pen be mightier than the mouse?

By Michael Fitzgerald
REDWOOD SHORES, CALIF.

A small pen-based vendor may have come up with a way to make the pen supplant the mouse.

Communication Intelligence Corp. (CIC) last week released Handwriter for Windows, which bundles its handwriting

recognition software with CalComp Corp.'s digitizer and Microsoft Corp.'s Pen Extensions for Windows. It will cost \$199 during its first 60 days and \$399 thereafter.

CIC said the handwriting recognition may prove less important than the ability to use the pen like a mouse, which could give the company an entree into the mas-

sive installed base for desktops. The company included several pen-oriented games, such as a crossword puzzle, with Handwriter for Windows. It also included Signature Sentinel, a security utility tied to the user's signature.

"Solitaire taught people about the mouse. People need to get used to the pen, and these games should help them

do that," said Madeline Duva, CIC director of business development.

Duva also pointed out that mice can be difficult to use on portables, so the product may gain some momentum there.

"You've got an increasing number of people interested in Windows in a portable environment, and the mouse itself is difficult to implement on portables," agreed Ray Boggs, an analyst at BIS Strategic Decisions in Norwell, Mass. "This could turn out to be an important idea."

Intel fixing PCI

CONTINUED FROM PAGE 45

Intel's integrated microcomputer division, which makes the PCI chip sets.

But Smith did acknowledge that the subsequent round of negotiations within the PCI SIG has been less fruitful in producing an agreement on how to move PCI forward in an open fashion. He said with

Local-bus architecture gives users faster I/O, graphics, sound and peripheral access.

so many companies involved, it was difficult to ensure that all vendors with patents that might relate to how the local bus operates threw

them into the ring.

Smith said Intel wants to avoid the situation that occurred when Dell, a Video Electronics Standards Association (VESA) member, unexpectedly announced that it held a patent related to VESA's VL local bus, temporarily causing some controversy around that bus.

Analysts said Intel's ability to hammer out patent issues within the PCI SIG is key to the openness of PCI.

"The danger here is PCI-II," Brown said. "The world was not worried about [IBM's Micro Channel Architecture], it was worried about giving control of the bus to IBM. I don't know why people are willing to trust Intel."

Smith countered, "We've been the only ones who've gone public with what we're willing to do, and we said we're willing to do it on an open and royalty-free basis. That's what we would like to see come out of this thing."

He added, "We feel that Intel and the industry benefit more by having [PCI] as an open standard than if we take it proprietary, and we've been consistent in that."

Rajesh Vashist, marketing manager at Adaptec, Inc. in Milpitas, Calif., and an original member of the PCI SIG, downplayed fears that the group may never formalize the standard.

"Intel has been very forward and open, and we think the progress we've made is excellent, given the size of the group," he said.

PCI was designed to accommodate cards built for Micro Channel, Extended Industry Standard and AT-bus architectures.



AT 9 A.M. HE DIDN'T KNOW HOW TO WORK WITH A DATABASE.

When Don Glor came to work on the morning of September 15th he'd never used a database before. Two hours later he'd developed his first application — it looks like a fire truck

actually it's a customized inventory and billing management system for the South County Fire Department, San Mateo County, CA.

Don was using Lotus[®] Approach[™] — the only database designed for fire fighters. And lawyers and doctors and business people. And anyone who isn't necessarily a computer expert.

world is no good if you can't use it. Approach is expressly designed to be easy. There's no programming to learn. No endless documentation to study. And according to independent

it. It was just too difficult to get a handle on. That's not surprising considering the 543 page supplemental language reference for programmers Don would've had to pore

through. Which looks like light reading next to Paradox's 1300 pages of programming instruction.

The difference is that their products were not designed for general business users.

With Approach you have database power that



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research. The average Approach user produces real results with their database in 2 hours."

This will surprise anyone who has tried to work with databases like Paradox[®] or Access[®].

According to Don, I tried Access and shelved

really is accessible, and you work in one of four familiar desktop items — reports, forms, mailing labels or form letters — that look and work just like you expect them to, to help you be productive right out of the box.



Approach has won over 25 major industry awards and accolades.

Desktop Computing

Baarns Consulting Group, Inc. has introduced Version 2.0 of the Baarns Utilities, a software package.

The product is a collection of 23 productivity-enhancing utilities for Microsoft Corp.'s Excel.

The Baarns Utilities 2.0 features extensive printing options, improved file

management and file grouping capabilities, customized start-up screens and tool bars and an assortment of text enhancement capabilities, according to the Sylmar, Calif., company.

This release offers improved versions of the Baarns AutoSave, Setup, Print Special and Zoom utilities.

Windows 3.1, Excel 4.0 and an 80286 or higher IBM-compatible with a minimum 2M bytes of RAM and 1M byte of free hard disk space is required.

A single-user version costs \$89.95.

► **Baarns Consulting Group**
(818) 362-9235

Nu-Mega Technologies, Inc. has introduced Version 2.0 of Bounds-Checker for Windows, a development tool.

The product has an event logging and viewing capability that offers automatic bug detection and shows the user the events that led to the problem, according to the Nashua, N.H., company.

Bounds-Checker's event log window saves the most recent events in memory, which allows users to view application programming interface calls, hooks, window and dialog box messages and tool help notifications.

Version 2.0 requires Windows 3.1 (running in enhanced mode) and a 386/486 or Intel Corp. Pentium-based PC with a minimum of 4M bytes of memory.

Bounds-Checker 2.0 for Windows costs \$249.

► **Nu-Mega Technologies**
(603) 889-2388

Andyne Computing Ltd. has introduced Andyne Pablo, a multidimensional data access and reporting tool.

Andyne Pablo provides an additional perspective on information by enabling users to extract multidimensional summary information from relational databases.

Pablo employs a HyperCube technology. According to the Kingston, Ontario, company, HyperCube is a means of storing and combining multidimensional summary information from almost any data source.

A point-and-click interface lets users manipulate and change summary information stored in HyperCube into reports.

A single copy of Pablo for the Macintosh costs \$695. A Windows version is scheduled for release in 1994.

► **Andyne Computing**
(613) 548-4355

Simpact Associates, Inc. has announced Version 1.3 of Remark, voice integration software.

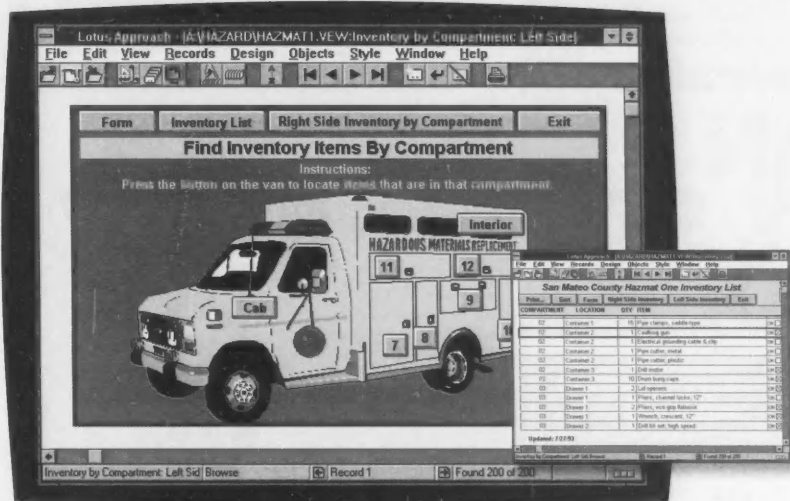
According to the San Diego company, the product allows networked PC users to include voice information in Windows applications and mobile users to use a telephone as a virtual workstation.

This release lets users link voice information to an electronic document, storing the voice on the Remark server instead of embedding it into documents.

Version 1.3 also features system administration enhancements, a simplified user interface and support for Novell, Inc.'s SPX/IPX protocol. Users have the option to streamline the recording process by reducing the steps involved with a simplified recording feature.

A base system with Remark voice and telephony server software and a Remark client software applications license costs \$2,850 and supports 25 to 50 users.

► **Simpact Associates**
(619) 565-1865



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Just because Approach is easy to use doesn't mean it's not powerful. This is a fully relational client/server database that received a perfect 5.0 score from PC Week Labs in both 'ease of use' and 'performance.'**

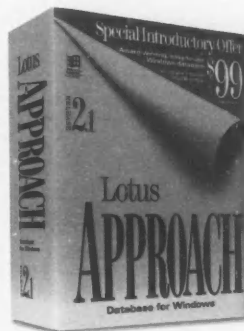
And with Approach access to existing databases is only a mouse click away. Our PowerKey™ technology lets you work with dBASE® Paradox, FoxPro®, Oracle® SQL, SQL Server and DB2™ data in its native format. With no filters and no imports involved.

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of this limited time offer. And discover the powerful relational database expressly designed for end users. Like Don Glor. And you.



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*1992 Using Release 2.0 Market Probe International, New York, NY, February 1993. **PC Week Labs 11/2/92. ***Requires MicroDecisionware Gateway. ****PC/Computing August 1993. ****Plus shipping and handling, if applicable. Offer good through 12/31/93. ©1993 Lotus Development Corporation. 15 Cambridge Parkway, Cambridge, MA 02142. Lotus and Working Together are registered trademarks of Lotus Development Corporation. Approach and PowerKey are trademarks of Approach Software Corporation, a wholly-owned subsidiary of Lotus Development Corporation. Microsoft Access and FoxPro are registered trademarks and Windows is a trademark of Microsoft Corporation. Paradox and dBASE are registered trademarks of Borland International Inc. Oracle is a registered trademark of Oracle Corporation. DB2 is a registered trademark of International Business Machines Corporation. In Canada call 1-800-GO-LOTUS.

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LAN
READY,
UH,
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SET,
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WAIT A
SECOND,
UH,
UH,
GO.

Workgroup Computing

RETAILERS BANK ON
CLIENT/SERVER, 57
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Windows users begin journey to Chicago

By Ed Scannell

Microsoft Corp. will begin moving its huge base of Windows 3.1 users to Chicago, its next-generation operating system, when it delivers Windows for Workgroups Version 3.11 early next month.

The new version sports a 32-bit file system — largely borrowed from Chicago — along with several 32-bit networking components, including a new redirector and IPX protocols. With the help of the 32-bit file system, the product is said to be 100% faster than the original version in some applications.

This transition is perhaps well-timed, coming shortly before Novell, Inc. is expected to formally introduce Novell DOS 7.0. That product will have preemptive multitasking, high levels of security and, of course, tight integration with NetWare.

Much of the added support for NetWare in Windows for Workgroups was driven by corporate users who also wanted greater central control over network privileges. Both of these items were missing from the first version, released last fall.

Experience counts

"IS focus groups over the last few months told us that [peer-to-peer networking] works well with experienced users who know what they are doing. But they often run into problems with inexperienced users who wander into directories they shouldn't," said Rogers Weed, lead product marketing manager of Windows for Workgroups.

With Version 3.11, Windows for Workgroups now supports Windows users, page 61

Much of the added support was driven by corporate users who wanted greater control over network privileges.

Think big picture for client/server

By Elisabeth Horwitt

Corporate users at two conferences recently took aim at one of the biggest barriers to successful client/server implementation: how to teach mainframe-oriented information systems managers to cope with the mishmash of protocols, formats, tools and architectures typical of so many corporate PC network installations.

Key participants at both conferences made the point that IS managers who assume they can work effectively in a client/server environment with their old, specialized, mainframe-based database or application development skills are almost certainly going to take a major fall.

A big reason corporate client/server implementations get into trouble is that the implementors typically go at the project like the proverbial blind men and the elephant: one understanding LANs, one understanding PC hardware and one knowing databases, said Paul Hamel, a senior vice president at Putnam Investments in Boston.

"Client/server reality is an integrated whole," Hamel said. Each developer needs to be "not an expert, but conversationally fluent" in all the key areas.

The problem, as identified last week by the Open User Recom-

mended Solutions (OURS) Multi-vendor Education Task Force, is to give IS managers a working knowledge in the basic areas of client/server implementation when each area is fragmented into incompatible, vendor-specific products.

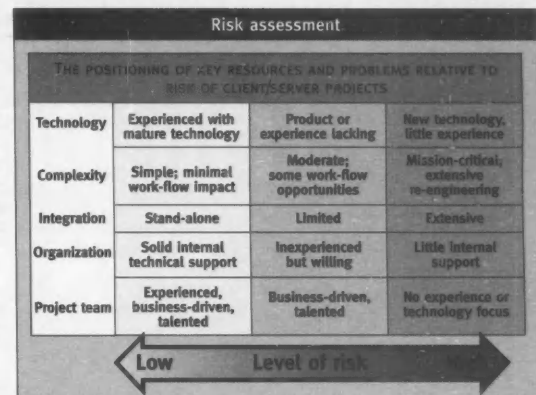
Something to strive for

The ideal would be industrywide software and hardware standards that would save corporations with heterogeneous environments from "having to replicate technical staffs with expertise in each of those particular platforms," according to Wade Brown, executive vice president and chief informa-

tion officer at Washington National Insurance Co.

Given that such standards are still a long way off, the OURS task force's answer to the immediate problem is "to come up with a core curriculum that would be consistent from vendor to vendor, so if you learn this, it applies across the board," said Donald Sternfeld, director of IS at law firm Morgan Lewis & Bockius in Philadelphia and a member of the OURS task force.

For example, an IS manager might learn the basics of how a network operating system works, Client/server, page 66



Source: Paul Hamel, senior vice president, Putnam Investments, Boston

CW Chart: Dave Marshall

GM hops on new document highway

By Michael Vizard
SAN FRANCISCO

Typical of corporate America's drive to get a handle on its mountains of paper, General Motors Corp. is employing a robust set of document management tools in a bid to gain more control over information assets.

One of the cornerstones of GM's effort will be an electronic delivery system from Electronic Book Technologies, Inc. (EBT) in Providence, R.I. The system will be used to distribute 3,500 documents, ranging from five to 150 pages each, to its engineers. GM and EBT revealed details of the project at the Seybold Conference Exposition '93 here last week.

Initially, GM will use EBT's DynaText delivery system to distribute documents that comply with the Standardized Generalized Markup Language (SGML) to about 1,000 engineers, with a target goal of supporting 30,000 engineers during the next couple of years.

GM is just beginning to implement a co-

ordinated electronic document management strategy, analysts said, as are other corporations with large amounts of on-line information that cannot be easily accessed by all users.

"People are just now becoming sophisticated about what electronic document management tools are, but the infrastructure isn't in place yet," said Carl Frappaolo, executive vice president of the Delphi Consulting Group in Boston.

"We'll start with the core engineers on major projects, but the plan is for everybody to be using it," said Terrence Sadlier, a GM systems development manager in the System Engineering/Technical Process Group. GM will deploy DynaText on its Unix and Windows workstations, which will be equipped with EBT hypertext searching and querying tools for accessing information on-line. "We'll probably be using a mix of electronic and paper distribution for

quite some time," he added.

At most major corporations, the move to adopt electronic distribution of documents will not be a panacea. However, it will provide an important tool in the quest to regain control over the information stored on individual systems and servers across an enterprise.

"Tracking and distributing documents has always been an unwieldy process, but the technology is finally there that you can begin trying to control this," said Priscilla Emery, a vice president at New Science Associates, Inc., a consulting firm in Westport, Conn.

Among those tools are CD-ROMs; electronic distribution technologies from companies such as EBT and Interleaf, Inc.; and imaging and work-flow software and font technology from companies such as Adobe Systems, Inc. At the same time, Microsoft Corp. is working to improve document-handling capabilities

in Windows 4.0, and PC application vendors are readying document management system strategies [CW, Oct. 11].

"Document management systems will be the traffic cops for accessing electronic document libraries," Frappaolo noted.

Client/server engine

Client/server computing is providing the underlying technology, which makes it easier to put data close to the end user. Client/server computing's emergence "has caused a reawakening about how we manage documents," Emery said.

For instance, at GM, Sadlier said, a wide-scale evaluation process is under way. "There's a lot of activity focused on getting more information out of product data, especially since it's updated just about every day."

As part of that effort, Sadlier said, GM is examining what role Lotus Development Corp.'s Notes might play in managing documents created on PC tools that do not directly support SGML. "Ideally, we're looking to see what kind of integration there will be between Notes, SGML and word processors using [Object Linking and Embedding] 2.0," Sadlier said.

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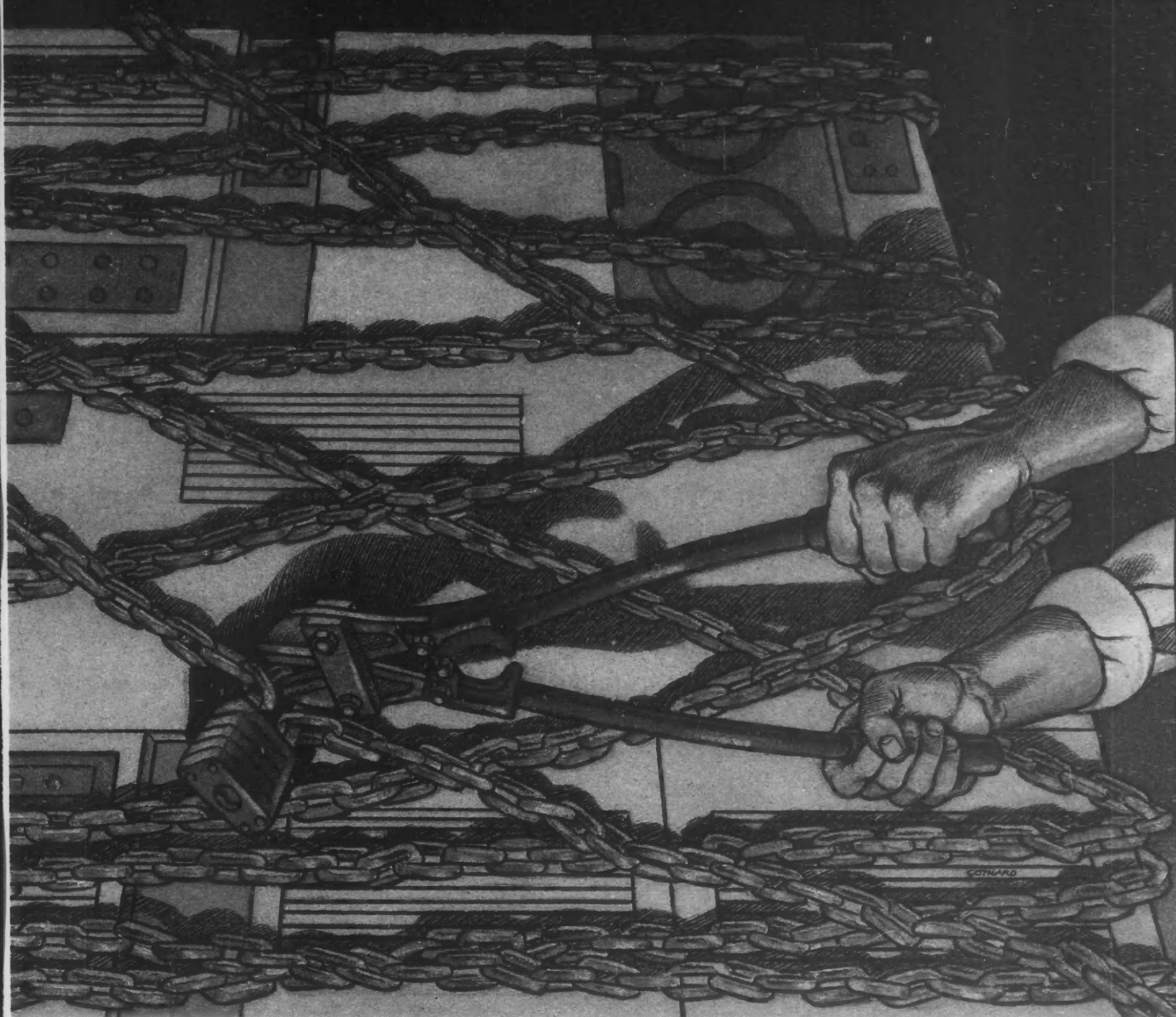
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Workgroup Computing

A cautionary tale

In 1990, Paul Hamel headed a project at Tectron Corp. to build an OS/2-based server front end to the mainframe system that handled the company's inventory finance business. The Providence, R.I., financial service company's goal was to provide customers with more flexible, customizable products while reducing cost and head count, thereby helping the division toward its goal of quadrupling business.

According to a matrix that Hamel later developed for evaluating the risks of a client/server project, the Textron implementation started out as high risk on all counts.

"We were building a system from scratch. We had no experience with OS/2 or Presentation Manager. We promised users a lot by a certain time. We were dealing with mission-critical applications. We were working with immature technologies, and we were technology- [rather than business-] driven," Hamel said.

To make matters worse, the programmers were re-engineering the business work flow at the same time they were hammering out the details of their client/server platform. Thus they got caught in the trap of repeatedly re-engineering things to get the ideal combination.

"If you are working with both a mainframe and a server as data servers, you get too many combinations of choices. Debates with database designers about what belonged where took weeks," Hamel said.

When the project slipped six months behind schedule in three months, the group stopped, put in a project manager, retrained the team and "moved the risk profile from high to medium," Hamel said.

The end result: The project missed the deadline incrementally but made the budget and delivered a "glitzy front end that got us new business" when it was shown to customers.

— Elisabeth Horwitt

Client/server

CONTINUED FROM PAGE 53

which would be applicable whether the system is from Novell, Inc., Banyan Systems, Inc. or Microsoft Corp.

The need for effective training, everyone agreed, is dire.

Formal training costs about \$1,350 per client/server application per employee, according to "Changing IS organizations: The effect of client/server implementation on job skills requirements," a report commissioned by OURS from Gartner Group, Inc. and presented at the recent meeting of the vendor/user organization in Boston. On the other hand, "an untrained user will spend between \$3,000 and \$5,000 to get to the same or lower skill level, a 300% hidden premium," the report said.

New skills set

Participants at the Technology Transfer Institute's Client/Server Applications and Systems Solutions Conference in New York last week also focused on the difficulties IS managers run up against when they try to apply mainframe-based skills in a client/server environment.

Hamel, for example, related how a client/server project he headed in a former job initially was a disaster, primarily because the team of IS managers tried to build a system from scratch with immature, complex and largely unfamiliar products (see story above).

At The Chase Manhattan Bank NA, "We took a position early on that training has to be considered part of the project, built into cost timescale and expectations," said Elaine Bond, a fellow at the bank and president of OURS.

One key aspect of that training is to

break down IS managers' mainframe "preconditioning." For example, "most mainframe folks think they can do everything on the mainframe that you can do on client/server," Bond said.

At Chase, however, as elsewhere, IS is still "sorting out what's generic" to developers' jobs and what is specific, she said. "If my job requires me to understand the difference between LAN and mainframe operating systems, don't train me" on Novell's NetWare.

Mythical savings

Another part of the job is puncturing myths about what client/server tools will do for productivity and costs. For example, corporate programmers naturally assume that graphics-based client application development tools, such as Microsoft's Visual Basic, will mean a huge increase in programmer productivity, on an order of 10 to 1, said Shaku Atre, president of Atre Associates, Inc.

"We see a 2-to-1 increase because, while you maybe have fewer programmers, you need more testers," she said.

The reason: Icon-driven programs provide far more chances for users to go astray than do the older, menu-driven systems.

Having made a first cut at training needs assessment by commissioning the Gartner Group report, the OURS task force plans next to hammer out a "matrix that details the level of specificity of client/server needs." It also plans research case studies of companies that have successfully implemented client/server solutions in terms of how they addressed the skills issue.

Eventually, the task force plans to work with vendors and educators on how best to deliver generic skills to IS managers who have become client/server application developers.

Workgroup Computing

Retailers take client/server initiatives to home offices

Some struggle with bottlenecks, others find savings

By Ellis Booker

Having proved the value of client/server in their stores during the past two years, many retailers now want to do the same for corporate applications in the home office.

The problem is that few companies have made this migration successfully.

"I've had experience with four retailers now that have tried to do it. Every one of them has failed," said Eric L. Denna at Brigham Young University's J. Willard & Alice S. Marriott School of Management in Provo, Utah.

"Retail is detail," said Denna, who attributed the bottleneck to I/O speeds of client/server-based systems. "When you're talking about Sears logging 50 million to 60 million event records every day, there isn't a client/server [system] today that can handle one-tenth of that."

Denna added that client/server is a very appropriate arrangement for use in stores because the amount of data that even the largest individual store collects is manageable.

Denna was one of the speakers at the RisCon '93 Expo earlier this month in Chicago, where client/server computing, wireless networking and ways of capturing and mining customer data were top issues. This year's three-day show attracted a record 5,409 attendees and more than 200 exhibiting vendors.

Making it work

Nevertheless, success stories are out there. The cases of Texas State Optical in Beaumont, Texas, and Galyan's in Plainfield, Ind., are typical.

Texas State Optical, an \$18 million manufacturer and retailer of prescription glasses, migrated off a proprietary NCR Corp. mainframe two years ago. It has since put all its business functions on a LAN-based system running the Paradox relational database from Borland

International, Inc.

According to Mike Sales, chief financial officer at Texas State, who attended RisCon with MIS director Kraig Black, the company has been able to slash its administrative and information systems support staff thanks to the new system.

At Galyan's, a \$50 million sporting goods company, an IBM RS/6000 server now supports about 100 users. It replaced a Data General Corp. platform 18 months ago.

"We're using commercial software augmented with an Informix database," said MIS director Michael Anderson.

One of the first

The Bombay Co. in Fort Worth, Texas, was an even earlier downsizer, although it chose an IBM AS/400 rather than a Unix platform when it began its move in 1991.

"The business is growing 30% to 40% per year, and while Unix would have given us the scalability we wanted, the software wasn't mature," said Christopher W. Buttine, director of IS.

The Bombay Co. took its administrative and financial systems off a Wang Laboratories, Inc. host in 1991 and its merchandising and inventory systems off an IBM System/38 last summer. Nowadays, two IBM AS/400s run the business in the corporate office and connect to 486-class point-of-sale (POS) terminals in the company's 400 retail locations.

Meanwhile, the rest of the retail industry is clearly walking the path forged by Kmart Corp. and others a few years ago: putting client/server-based networks in stores. A typical configuration sports PC-compatible POS devices at checkout counters connected over a LAN to one or more high-end processors. These in-store processors, in turn, communicate with corporate hosts over dedicated, dial-up or satellite communication links.

Mainframes made more efficient

For retailers that want to "mine" hundred million-record databases quickly, Price Waterhouse offers a product for IBM mainframes called Geneva, a system software architecture that is said to make data capture and data analysis on a mainframe more nimble.

Geneva, now being tested in a handful of retail locations, is a data-independent architecture that separates the placement and relationships between data elements from the raw data itself. As a result, a mainframe running Geneva can show a dramatic increase in performance when it

comes to examining a large volume of data.

Price Waterhouse said customized machine code functions in Geneva Version 2.0 yielded a fifteenfold performance increase over the previous custom Cobol version of the code functions, and a sixtyfold increase over the previous generalized Cobol code functions. The current version of Geneva runs at 1 CPU second per view per million records; a 30% decrease in this cycle time was achieved in Version 3 of the software, which became commercially available last month.

—Ellis Booker

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USING NOTES, YOU YOUR HEAD IN NEW Y AND STILL LEAVE YOUR H

Project Alert
Author: Ted Buckman (New York) Composed: 08/21 04:10 PM
Subject: Alert: Client requesting materials change

Hi today's client review meeting, Mr. Crump announced that he has changed his mind and now wants to install the energy saving glass (ES-4000-X) in all exterior windows. I advised him that this would force design changes and possibly result in a slip in the schedule and an increase in overall cost. He is highly committed to making the change based on the follow energy reviews, and is confident that we can sell it off without changing the schedule or schedule the budget.

Here are some preliminary cost estimates - Let's determine a plan of action ASAP. To move forward we'll need drawing adjustments, ECO's, materials negotiations and the OK from Thierry's team in Montreal. I've pulled the figures below from the Supplier's Catalogue database. Let's hope we can locate the glass and negotiate a better price with the supplier.

Cost Comparison				
Standard Glass	PW-00646	\$623.00	644	398,122.00
Energy Saver	ES-4206-X	\$992.80	644	398,122.00
Cost of Change				

Following a client meeting Ted the Account Manager in NY gives a Project Alert to the Project Tracking Database describing some last-minute client changes. All key individuals on the project are automatically notified. He includes a spreadsheet comparing prices from the Notes Supplier Cost database.

Project Tracking Newbury Centre - Main View

11/08/93
Alert: Client requesting materials change (Ted Buckman (New York), 3 responses)
We must not allow this to cause an overrun (Diack Dragan (Paris), 1 response)
Consider future energy savings (E) into cost - I will work on numbers (Diack Dragan (Paris))
This change cannot be allowed to affect the completion date (James Crump (New York))
Only one supplier in Paris carries this new window - I will require images on availability (Jacques Perrot, 1 response)
August - Here are the exact specs for the purchase order - can we meet our delivery schedule? (Ted Buckman (New York))
Mon Diack A major change at this site date? (Thierry Beuchard (Montreal))
Revised drawings for approval - ECD will be needed today (Diack Dragan (Paris))

22/08/93
E23 64
Hi
Response to "Alert: Client requesting materials change"
Author: Thierry Beuchard (Montreal) Composed: 31/08 23:58

28/07/93
Change
Hi
You are trying to drive me mad, aren't you? I repeat coverage more changes at this point, stand up doing in delivery of materials past 10 October will result in last labor cost of 20,000 francs more. Also, we must have all glass in place by 1 Nov. before winter weather slows us down.
GUT - If you can get the new drawings and ECO to me, in the next 24 hours with no complete delivery date, then I think I will be able to work it into the current construction schedule and give labor accordingly. I'll be on the lookout for the ECO and the drawings however, otherwise I'm afraid we must tell our client that it cannot be done. - Thierry

Thierry the construction site manager in Montreal responds to the Notes and sends the Alert to all key individuals on the project including James Crump the Project Manager in New York. He includes a spreadsheet comparing prices from the Notes Supplier Cost database.

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Reverse the architect in San Francisco gets to work on the drawings. But first, she checks the Project Archives data-replicated from the server in Toronto where money was actually saved even before material costs increased. She finds the revised drawings, including the details on the Toronto job for the client's approval.

Lotus Notes - Response to "What's Changed regarding sustainable change?"

Author: Roberta Hughes (San Francisco) Composed: 00:01 07:30 PM
Ready: "Revised drawings for approval - EDO will be routed today."

"We got Ted's Project Alert yesterday and began revising the drawings right away. Got this I think we can actually **SAVE** some money by making this adjustment. I searched the Project Archives database and found two other sites that used this glass recently. Toronto reported that this installation time was 20% below prediction because the factory will do frame pre-assembly. Adjusting our design will result in a cosmetic change to the facade and a revised materials order, but only a minor structural adjustment. (see drawing) Here is a close-up of the new design and the CAD file is attached for review and approval."

Congratulations team, we did it! Please Mark to Approve Changes:

TH FRAME
1/2" THICK GLASS

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to consider the next step.



Does your software h
evolving world? Or will it



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n have the ability to adapt in an
t fall prey to the changing times?



In a world where technology seems to change by the minute, finding flexible business software with the necessary features to survive can be a difficult task. It may be fine for your present demands, but what happens as technology and the needs of your company evolve?

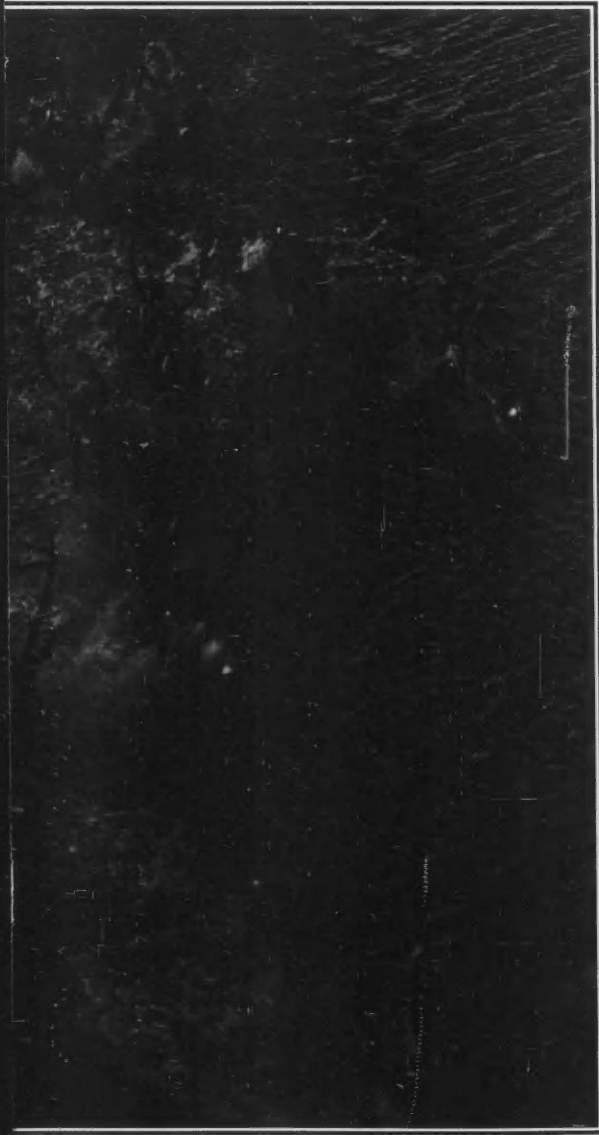
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Is your software
new territory?



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Are company leading you into Or just migrating with the herd?



These days the talk is all about the migration to open systems. But how can you be certain you're getting the right technology and not just following the crowd?

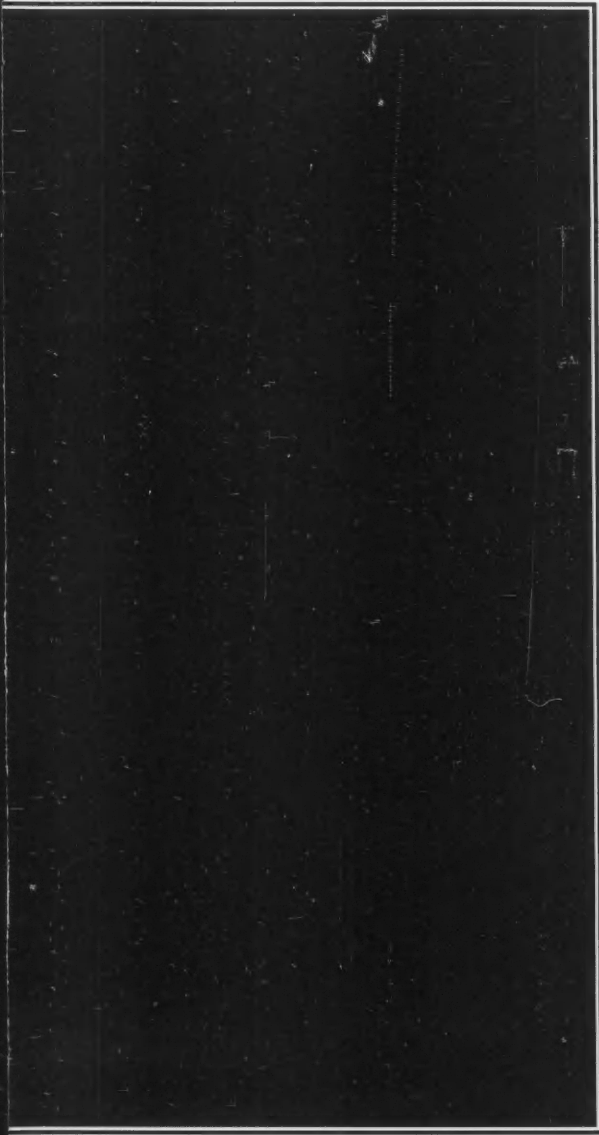
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mes from knowing when to act.



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M U L T I N A T I O N A L B U S I N E S S S O F T W A R E

Workgroup Computing

Windows users

CONTINUED FROM PAGE 53

NetWare's Open Document Interface drivers and can run peer-to-peer services over a new 32-bit IPX protocol. Some users think this support makes Windows for Workgroups a more appealing client in heterogeneous networks.

"The enhanced support for NetWare makes it an ideal client for PCs operating in heterogeneous networks," said Paul Fjeldsted, an engineer at Hewlett-Packard Co.'s scientific instruments division.

Microsoft has also added support for its recently released Windows NT operating system. With the new 32-bit networking and disk-access features, company officials will position Version 3.11 as a more ideal client to Windows NT for client/server or mission-critical applications.

The latest version has also added support for remote users who can now access all of the program's features from the road. Now a complete superset of Windows 3.1, Version 3.11 is reportedly 50% faster than the original.

Fast around the track

Much of the product's added speed has to do with its 32-bit file system, which is borrowed largely from Chicago, the 32-bit version of Windows due in the second half of 1994.

"What we have is a 32-bit version of the [file allocation table]," Weed said. "It speeds up I/O requests from Windows both to local drives and to ones over the network."

The first manifestation of Microsoft's At Work operating system appears in Version 3.11: the ability to send and receive messages and fax files that can be edited from one Windows for Workgroups machine to another.

"This means I can have a peer-to-peer network and put a fax/modem in one PC and share it with all other PCs on the network," said Tom Gibson, PC coordinator at Weyerhaeuser Co. in Portland, Ore. "Anyone can send a mail message with a fax to anyone on the network."

Unflattering label

Trying to refute the "Windows for Warehouses" tag that some have placed on the product because of sluggish sales, company officials announced earlier this month that they have sold more than 1 million copies of the product. However, several analysts have noted that the

number of copies in use is likely lower.

If Microsoft can win the hearts of users with added speed and features, it may also try to buy their hearts. The company has priced the upgrade of the product at \$50 for registered users of Windows 3.1.

The full package, aimed primarily at DOS users wanting to add Windows and networking support, will cost \$219.95 for the first 90 days of availability.

After that, the price will rise to \$249.95. It should be widely available through re-

sellers early next month.

The Workgroup Add-On For Windows is targeted at Windows 3.1 or Windows for Workgroups 3.1 users who want to gain more networking capabilities. It will be offered at \$69.95 for the first 90 days and \$89.95 after that.

Trying to hook DOS-based users, Microsoft also unveiled The Workgroup Add-On for DOS, which features DOS peer service capabilities. This product was designed to let users take better ad-

vantage of older hardware systems as print or file servers. Expected to be available a few weeks after Windows for Workgroups 3.11, Add-On for DOS carries a retail price of \$49.95.

Minimum software and hardware requirements for the product include DOS 3.3 or higher, a 386SX-based system with 3M bytes of RAM (although the company recommends 4M bytes) and 7M bytes of hard disk space (although the company suggests 12M bytes).

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Low-end server descends from rugged line

By Stephen P. Klett Jr.
HOUSTON

Texas Microsystems, Inc. last week jumped into the low-end server race, unveiling the first of a family of fault-tolerant servers aimed at workgroups of up to 50 users.

The company also spun off a new busi-

ness unit, called the Fault Tolerant Systems Division, to manufacture and market the server line.

The Fault-Tolerant Systems Architecture (FTSA) server offers dual, hot-swappable power supplies and mirrored disk drives. Hot-swappable disk drives are slated for the first quarter next year, said Charles D. Hultgren, general manager of

the Fault-Tolerant Systems Division.

The FTSA includes a diagnostic coprocessor card that monitors system components and notifies administrators of component failures. A data auditing and recovery feature allows administrators to reconstruct lost data.

Alpha-test site Kontek Industries in New Madrid, Mo., has been using the

server to run its accounting and computer-aided design software on roughly 20 PCs for about a year.

"The built-in redundant power supply and mirrored drives were key in making the decision to go with Texas Micro," said Sheila Marshall, a controller at the engineering firm. "We've had problems in the past with losing data due to power outages, and we haven't experienced any such problems with [the FTSA]."

The FTSA represents Texas Micro's first push into the commercial server market. It is a scaled-down version of the firm's ruggedized high-end industrial server, which debuted one year ago.

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High hurdle

"Name recognition represents our biggest hurdle out of the gate," Hultgren said. "However, we believe our price point and reliability features are in line with competitors' products, such as Compaq's ProLiant line."

"Server vendors are scrambling to bring the reliability qualities of minis and mainframes down to the PC level," said Susan Frankle, an analyst at market research firm International Data Corp. in Framingham, Mass. "This [low-end] segment of the market is very competitive and is just starting to heat up. Texas Micro is getting in at the right time."

In addition to fault tolerance, the FTSA also inherits the ruggedized features of its industrial forefather, such as extra fans for cooling and a chassis built from heavy-gauge steel, and was designed to operate at temperatures ranging from 0 to 55 degrees Celsius.

Pricing for the FTSA begins at \$9,500 for an XT/AT bus-based system that includes an Intel Corp. 33-MHz i486 microprocessor, 4M bytes of RAM, 245M bytes of disk storage, keyboard and Super VGA controller. An Extended Industry Standard Architecture version is slated for early next year and will start at \$12,000.

The server supports several operating systems, including Novell, Inc.'s NetWare and IBM's OS/2. Support for Microsoft Corp.'s Windows NT and Intel's Pentium processor is planned for early next year.

Brief

Oracle prices 'Ware'

OracleWare, a bundling of Oracle Corp.'s database and electronic-mail system with Novell, Inc.'s NetWare or UnixWare announced four months ago, will be priced at \$250 per user, according to Oracle Chief Executive Officer Larry Ellison. That falls square in the face of Microsoft Corp., which is offering a desktop version of its SQL Server database for Windows NT for as low as \$199 — albeit as a limited-time-only discount for OS/2 converts. OracleWare's first iteration — Oracle 7 on NetWare 3.12 — is due out next month, officials said. The UnixWare version is slated for delivery by year's end, Oracle said.

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By Dr. Laurence Walker, Vice President
Worldwide Networks Engineering
Digital Equipment Corporation

By now, the news is out.

Digital is changing the way it does business — not just in small steps, but in leaps and bounds. The customer is at the heart of our work as we simplify the process of doing business and strengthen our core competencies.

Networking is one area where Digital offers incomparable strength and uncompromising breadth to bridge customers' business applications through client/server computing. But tying together computers and people with the network is successful only if networks are easy to install, use, and manage.

By incorporating this ease-of-integration network focus into our unified open network strategy, Digital is committed to delivering flexible and modular products with built-in intelligence and management along with integrating multiple network technologies, protocols, operating systems, and future technologies.

Client/Server Networking: Fundamental to Business Success

Client/server networking is truly at the heart of business success. Businesses are demanding nothing less than top network performance. With client/server networking, the computing system that used to run on a single machine is now a distributed system — a network — spread across multiple computers, technologies, geographies, and organizational functions.

The network takes on the role of integrating diverse systems, multi-technologies and protocols, and mixed software platforms to interoperate with each other. The resulting challenge? To implement networking solutions that are:

- Scalable from small workgroups to large corporate offices
- Flexible, to cost-effectively meet users' changing requirements
- Able to integrate applications on disparate system platforms
- Easy to manage
- Compatible with both existing and future innovative technologies

Digital Puts It All Together

For nearly twenty years, Digital has been an undisputed leader in networks. In fact, we have grown our networking capabilities into a more than \$1 billion business through successful installation of more than 110,000 networks and networking of more than 1.5 million systems. In short, we have the staying power, commitment, and strategy to deliver the best and most comprehensive range of networking products and services for open client/server solutions.

Network News



Today's Top Story



**Digital's Networking Strategy:
Putting Open Client/Server
Computing to Work**

Digital's open networking strategy provides future directions in network software, hardware, and emerging technologies, with focus in critical products areas such as:

▪ Network Operating Systems (NOS) — PATHWORKS Product Family

Offering out-of-the-box system integration and the easiest management of PCs, servers, and multivendor NOS.

▪ Network Interconnect — The DEChub 900 MultiSwitch

Offering the lowest-cost adds, moves, and changes of any hub around.

▪ Mobile and Wireless — WaveLAN and DECtransporter Products

Giving users boundless freedom to access information anytime and anywhere.

Network Operating Systems

Users need secure access to data regardless of the PC platform or operating system. But PC "islands" running popular NOS software present network managers and users with the challenge of first getting to and then managing data.

Digital's network operating system strategy focuses on integrating a multivendor PC LAN into enterprise networks.

The PATHWORKS product family, Digital's PC networking and integration software, enables users to weave together all major client PCs, database server systems, and networking protocols into a single open network. Network managers and users can now access files and services and manage NetWare, LAN Manager, and AppleShare PCs while using familiar interfaces. PATHWORKS products can connect these workgroup LANs with resources and services on the wide area network.

Network Interconnect Products

Business changes create unending network changes. With 80 percent of all networks needing some kind of reconfiguration every year, network flexibility is crucial for adapting to change and minimizing cost.

Digital's network interconnect strategy focuses on universal connectivity and multivendor interoperability through the delivery of flexible, reliable, easy-to-manage, high-speed networking systems with built-in intelligence.

A key product within this strategy is the DEChub 900 MultiSwitch — the most cost-effective way to add, move, or make changes to the network.

The DEChub 900 MultiSwitch — with more than 3 gigabits of Ethernet, Token Ring, and FDDI — provides bandwidth on demand. It also offers unsurpassed modularity with modules that snap freely into the backplane or can be used as standalone units. In addition, it has the flexibility to switch ports LAN-to-LAN with graphical software on a PC or workstation.

continued on page 2 ►

PUTTING IMAGINATION TO WORK

i imagine a network that adapts to your environment.

digital

Digital's networking strategy focuses on easy-to-use network integration products and services to help customers quickly evolve to open client/server computing.

Repeater, concentrator, and router modules are designed "hub-ready." The newest addition to Digital's multiprotocol router family, the DEChrouter 90 bridging router, offers low-cost LAN connections and remote access for Digital and Cisco environments and supports all popular networking protocols and router standards.

Another key benefit of the DEChub 900 MultiSwitch is its built-in investment protection. The product has been designed to allow more than 20,000 installed DEChub 90 modules to snap into and be managed in it. Plus, the DEChub 900 MultiSwitch will integrate future technologies as they arise, such as asynchronous transfer mode (ATM).

In addition, we complement our hub offerings with a line of switches and routers — for campus and enterprise integration — as well as

network interface cards (NICs) for desktop appliance connectivity.

Mobile and Wireless Products

Today, workforce mobility is becoming increasingly critical for business. Completing work away from the office requires simple and secure access for those professionals who demand the freedom to easily access the network anywhere, anytime.

In answer to those demands, Digital has launched mobile and wireless products into the marketplace today. With the wireless WaveLAN product, users can use networked PCs — without a physical network connection. With DEChtransporter software, users can access networked resources — from wherever they work.

For the future, Digital will continue to deliver leadership products to address mobile,

wireless, multimedia, cable TV, and public transport areas.

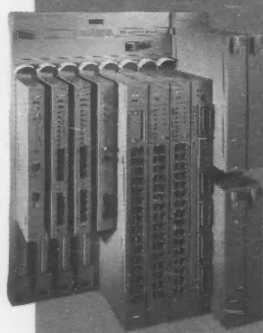
Putting Innovation to Work

Digital's open networking strategy offers easy-to-integrate, easy-to-manage network solutions that logically and physically connect clients to servers. We can help you build workgroups with PATHWORKS products and hubs; tie together global information highways with routers, gateways, and high-speed switches; and give you boundless freedom through mobile and wireless networking.

Most important is how these technologies affect your bottom line. That's why Digital is committed to working with what you have while paving the way for future innovation, growth, and success. ■



Network Change Made Easy With Digital's Family of Intelligent Hubs



DEChub 900 MultiSwitch

There's nothing permanent except change.

It may be an old saying, but it's one that is still quite valid in this modern age of computers, networks, and the migration to distributed, client/server computing.

Changes in your network mean new challenges for you. Critical applications may move from central mainframes to remote desktops. Or, high-performance multimedia applications need to be accommodated at a time when bandwidth is scarce. By far, your biggest challenge is to integrate diverse architectures, technologies, and protocols within a single enterprise network.

These kinds of complex networking solutions require flexible, cost-effective hub-based solutions. And Digital has them. The DEChub family of modular, intelligent hubs is your key to accommodating network change by providing high-performance network access, flexible configuration, network management, and security.

A Family Affair

Whether your focus is small, remote workgroups and large, company-wide networks today or emerging, high-performance networks tomorrow, Digital's DEChub products — including DEChub One, DEChub 90, and DEChub 900 — allow you to build small LANs, then scale upward in small increments or large steps to large, global networks. What's more, you can count on our family of hubs to deliver:

High-Performance Network Access

Digital's family of DEChub products supports large numbers of bus-, ring-, and even cell-based connections in virtually unlimited combinations within a single hub.

Flexible Configuration

Each member of the DEChub family can be installed and managed as an individual, standalone device on the network, or as part of a multislot hub configuration. In addition, DEChub products — with their versatile backplane design — allow you to change configuration quickly and easily without physically modifying the network — or disrupting users. In fact, modules, hub slots, and network segments can be assigned at will. No physical reconfiguration of the hub is required.

Ease of Use

HUBwatch, Digital's DEChub management application supporting OpenVMS, UNIX, and Windows NT operating systems, makes management tasks easy by providing a graphical means of reconfiguring the network. To switch users from one

Dealing with moves, adds, or changes to your network? Digital's intelligent hubs help you handle it all with ease and flexibility.

LAN segment to another, or to integrate new technologies, simply click and drag to create the new network connection.

Built-in Investment Protection

Digital's latest addition to the DEChub family of products makes it even easier and more cost-effective for you to respond to changing network requirements. Like DEChub 90 products, our new 8-slot DEChub 900 MultiSwitch provides the unique capability of working in either "nick and stack" or multislot hub configurations.

In addition, the DEChub 900 product set supports multiple current technologies such as Ethernet, Token Ring, and FDDI. And with a high-performance backplane (bandwidth of 3 gigabits per second), the DEChub 900 module provides a clear pathway to emerging technologies, such as asynchronous transfer mode (ATM) — protecting your investment well into the future. Plus, your current DEChub investments are secure as all DEChub 90 modules operate and are manageable in the DEChub 900 module.

Digital's DEChub 900 MultiSwitch also features unique load-sharing redundant power and optional battery backup — ensuring that the network will continue to run even in the event of disaster.

For more information on Digital's networking products, or to receive your FREE copy of Digital's DEChub catalog, call 800-DIGITAL (800-344-4825) and reference code BFJ. ■

i imagine the best solutions for your business needs.

Meet Your Business Challenges

WITH DIGITAL SOLUTIONS FOR MIGRATION

Migration is one alternative for meeting your changing business needs. And who better than Digital to help you every step of the way.

Global competition. Shorter product life cycles. An accelerated rate of technology change. Business challenges are all around you — making it harder for your company to remain competitive in the '90s.

Whether you prefer to call it downsizing, upsizing, or right-sizing, companies like yours will be forced to take a long, hard look at their computer resources. As you look for new ways to streamline your business, sustain competitive advantage, and reduce operational costs, you will need to consider doing things differently.

Take Steps Toward Successful Migration

Digital understands that the migration process can be a complex prospect if it is not well thought out. Good planning is key. That's why it is critical that your company — large or small — follow five basic steps toward successful migration. These include:

- Identifying your business goals, needs, and wants
- Identifying possible solutions including rehosting, rearchitecting, or reengineering
- Determining the feasibility of each solution from a financial, technical, and operational perspective
- Choosing the appropriate solution
- Developing a plan to implement your solution of choice

Having already helped many companies migrate from non-Digital platforms, Digital has demonstrated flexibility in enabling companies like yours to address each of these steps. For example, your company may have some of the resources to carry out the migration. In that case, we will tailor the project to meet your specific needs. This includes formation of a team that may consist of your staff, our migration specialists, and appropriate partners as required to ensure a quality solution delivered on time and within budget.

We also offer a complete migration solution for those businesses that may need more assistance or prefer to outsource. In doing so, Digital can take care of all the details including converting your applications, training your people, and managing the implementation of the total solution.

Take Advantage of All We Offer

What exactly do we mean when we say that Digital offers the complete migration solutions package? Take a look.

Multivendor Services

For starters, we offer multivendor services for your existing computing environment — be it Hewlett-Packard, Sun, IBM, Prime, Wang, Data General, etc. You continue to use your current system until the new solution is safely up and running to your satisfaction. These services facilitate periods of coexistence or ongoing multiplatform development — meaning no downtime and no productivity loss for your business.

Migration Tools

Digital offers industry-standard migration tools such as DECmessageQ and DEC FullSail products to streamline the application conversion process. A broad range of industry-standard tools from our business partners are also available to facilitate various aspects of the migration process. Our migration partners include:

- Alternative Office Solutions
- Arris Software
- Boston Software Works
- Computron Technologies Corporation
- IDSI
- UNICON
- Unidata, Inc.
- VMark Software, Inc.

Consulting Services

We have an expert staff of consultants experienced in migration from non-Digital to Digital-based solutions. Consulting services include:

- Application reengineering and migration services for ease in code conversion and migration from your current computing environment to the target environment.
- Customized training that lets you choose from a range of education options to match the needs of your organization. Courses cover the target system, software, networking, systems management, and more.
- On-site hardware and software maintenance for non-Digital as well as Digital systems.

You Choose the Platform

No matter what platform you choose to migrate to — including Digital's Alpha AXP platform running DEC OSF/1 AXP, Windows NT, or OpenVMS operating systems — we'll help you get there. In fact, we simplify migration of your applications to the Alpha AXP platform via Digital's Privileged Architecture Library (PALcode).

Essentially, PALcode enables the software to become independent of the hardware architecture — allowing you to run other operating systems on Digital's revolutionary 64-bit Alpha AXP platform. PALcode is like a microcode library on the chip that enables you to translate the calls of different operating systems and/or applications. Once the call is translated, it is then executed by the Alpha AXP system.

You are also free to choose the database that's right for your business needs. Digital's migration methodology and tools allow you to migrate to DEC OSF/1 AXP or Windows NT operating systems with databases that include INFORMIX, INGRES, ORACLE, PI/Open, SYBASE, Unidata, PROGRESS, or Rdb.

We Deliver the Complete Package

Whatever you need for successful migration, Digital has the tools, services, partners, and experience to help you make the most appropriate choice for your business. We understand your need to meet the business challenges of the '90s head on. And we're here to help you do it.

For information on Digital Solutions for Migration, call 508-467-2708. Answer a few brief questions about your company to receive a FREE Digital Solutions for Migration videotape. ■

WHAT OUR CUSTOMERS ARE SAYING

"A chemist at Argonne National Laboratory who used to run complex molecular analysis applications on a CRAY Y-MP system has moved them over to a DEC 3000 Model 500 system running DEC OSF/1 AXP software because of the superior price/performance and ease of use. I have an application that runs for 24 hours on a Sun SPARCstation 2 system. It runs for only 3 hours on a DEC 3000 Model 500 system."

Mark Anderson
Argonne National Laboratory

"Right now, our people need to access data from both the Wang and the Digital systems. Since Digital integrated the two systems, we can access both using a single VT terminal. And our branch office users can actually access Wang data through the Digital systems and network faster than they could through the direct terminal-to-Wang communications we had in place before."

Dave Wilson, Vice President of Data Operations
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Advanced Technology Services	OptiDoc Document Imaging, OptiDoc Cold, OptiDoc Barcode, OptiDoc OCR, OptiDoc FullTEXT Indexing
AHP Systems, Inc.	KEREN'S "Finite"
Aloys, Inc.	TeleUSE 2.1.5
AOS	SEARCHmate/VMS DOS
Applied Information Systems Inc.	Burcom, Ulysses, XESS
Arcadd, Inc.	LottaCadd
Argent	JAMS, AGP, Argent/Archive, DiskSaver
The ASK Group, Inc.	INGRES Intelligent Database
Automation Management & Services	Apropos, Devote, PC Menu
BDS Systems	Xcalibur Image Processing, VEST, V-tac, MED-X
Beacon Expert Systems, Inc.	Negotiator Pro for Windows, DOS, Mac, NPro Module, IMP
Beair Computer Systems, Inc.	IMON, EMON, DMON, SMON
Bellwether	Purchasing Order & Receiving Software, Requisition S/W, Requisition Proposal S/W, Inventory Control Software
Bernstein & Associates, Inc.	Response Time Monitor, Network Traffic Advisor
BGS Systems	BEST/1 for Open VMS, BEST/1-Visualizer
Boston Business Computing	VCL, VBackup, VMail, EDT+
Bowden Systems, Inc.	BSI-X6530
Braintree	Auditor Plus, Governor, Fast Copy, Overseer
BGA Systems	GAINS Forecasting, and Inventory Planning Manager, GAINS Distribution Planning Manager
Buzzwords International	WINGEN, Professional EDIT, ANALYST GOLD
BVI Technologies	BVC Process Monitoring & Control Software
CAP Systems, Inc.	Captain
CEDRA Corporation	CEDRA SEA, CEDRA LAND, CEDRA SAND, CEDRA WATER
Century Analysis Inc.	CAI Integration Toolset
CIS	RoboCharge, RoboSecure
Compu-Share	Receivables Management System, Payables Management System, Payroll Management System
CompuSoft	Human Resources, Financial Information Control System, Manufacturing and/or Distributing
Comstow Information Services	Basic Bibliotech
Coromanel Industries	Integra VDB for Visual C++, Visual Basic
CorVision	CorVision
CPIex	CPIex Linear Optimizer, Callable Library, Mixed Integer, Optimizer, Library
CSSC	TOPS, AD-HOC
Data Center Software	MONITOR/PLUS, QueueMan
Data Pro Accounting Software	Infinity Advanced Accounting Solutions
Data Processing Design	Gold-Fax, Gold-Mail
Datametrics	Viewpoint for Open VMS/VAX, AXP, Datametrics Jobwatcher
Decathlon Data Systems, Inc.	GOLDMEDAL Elite, GOLDMEDAL Workgroup
Dialogue Software	ANALYST DSS, Access Executive
Dimeric	easyDBA for ORACLE, easyDBA Executive, easyDBA Table Editor
Distribution Architects International	DAI MASTER DISTRIBUTION SYSTEM (mds) MODULES
EasyEntry Software	EasyEntry
EEC Systems	Supercache, SuperDisk
Elery Systems, Inc.	Elery Open Systems
EMIS (Effective Management Systems)	Food Distribution Management System, Vending Management System, Office Coffee Management
ERGDIC System, Inc.	MDS32 Overseer, MacroSpillout
ESCOM	PMC, JMC, MMC
Evans & Ricker, Inc.	Relational Application Programmer Toolkit, System Manager
Everset	Automated Resource Toolkit
Executive Software	Peak Advisor/Fundamentals, Peak Advisor/Advanced
Financial Accounting Systems	DISKEEPER PERFORMANCE EDITION, VO EXPRESS, DISKEEPER Alpha AXP, FILEMASTER
FutureSoft	Loan Related Software
GEJAC Incorporated	DynaCom 3.1 for Windows, Terminal Plus
Gimpel Software	ARSAIP for VMS, ARSAIP for UNIX
Graphic Data Systems	FlexiList
GSI	GDS Drafter License, GDS GIS License
Humanic Design Corp.	TOLAS (Distribution, Logistics, Financial)
IBES	Empire/SOL HRMS
Information Builders	Financial Accounting Control, Integrated Distribution and Integrated Manufacturing System
Innovative Software	FOCUS for OpenVMS (NOT FOCUS for OpenVMS customer)
Integrated Solutions Inc.	Powerstation
Integrated Systems, Inc.	Graphical Environment Builder, XMS, Graphical System Manager
Intelligent Software Solutions	Xmath
Interactive Software	XNET License
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ISE, Inc.	TELEMARK SD
KPY Network Partners	SCHEDULE, MEDIA, ACT/PROJECT
Krig Research	Trapper
Logical Technology, Inc.	Picture Center Imaging and Visualization System
MEC	Hazmin, Logitrac, MSDS Solution, Chemical Compliance Monitor, Directory
Mercury	Wizword, WIZdraw, MASS-11 Classic Document Processor
MKI Morrison Knudsen Corporation	XRunner Automated Software Testing Tool, XRunner Text Recognition License
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MUST	NOMAD for OpenVMS, Reporter NOMAD OpenVMS, NOMAD Srv for Rdb, NOMAD Srv for RMS
NetWeave	NetWeave
NSS	Watcher
Numerical Algorithms Group, Inc.	NAG Fortran 90 Compiler, NAG Fortran Library, NAG Graphics Library, NAG Online Help, NAG Fortran/Matlab Gateway Generator
Objective Solutions	ORIN Designer for VMS ORIN Designer for ULTRIX, ORIN Designer for OS/1, ORIN Designer for Windows, ORIN End User Executable
Orntool	Fax Sr. Forms Package, Fax Sr. PATHWORKS Package, Fax Sr. ALL-IN-1 Package, Fax Sr. WordPerfect Package
P-STAT, Inc.	Pstat Base Program, Tabs, Advanced Statistics, Data Entry, SQL & Xpstat module
Paritaja Consulting	Armadio Tools, ATXtract, Atreport
PCS Systems, Inc.	Scanner-face, Scan-EVA/View, Scan-EVA/Annotate, SKL-View
Pennington Systems	XTRAN
Performance Software	V-Test, V-Timer, Video (Alpha AXP version only)
Performance Software, Inc.	ACT III Multimedia
PIXAR	Pixars RenderMan Toolkit, NetRenderMan
Polestar Software	Polestar Windows & Mirror for OpenVMS VAX
Process Control Systems	WORCS, LRS
Progressive Computer Systems, Inc.	TIREPRO
PROSIG USA	Dats Plus Signal Processing Software Package
PSA	Bac/Plus Backup Management Software
PSI - Paralog Systems International	TRIP
Puzzle System Corporation	SoftNet Utilities
QTC	Mass Advantage, Stack Advantage, Spec Advantage, Alpha Advantage, Software Foundry, GIS
READY TO RUN SOFTWARE	LANGUAGEPAK, OFFICEPAK, TESTPAK, DESKPAK, UTILITYPAK, COMMPACK, XPAK, XTRAAPK, BBSPAK, FUNPAK
Research Systems, Inc.	ENVI
Saiga	Htman, Ferrett, RA, VDM, Watch
Sapiens	Sapiens SmartStar and Sapiens-Smart Report Painter
Scandura	PRODco Components
SIS	INSIGHT, SIS RAD, SISHeart
Software Development & Support	Quick-EST, Summit
Software Moguls, Inc.	SM-Arch
Software Partners/32, Inc.	Hierarchy, Thruway
Spectra Data Systems	Radio Frequency Distribution, Warehouse Distribution, Property Management, Seafood, Route, Job-Cost
Spokane Computer	Facs
Spotlight Graphics	Spotlight Ray Tracer, Spotlight Rendering Libraries, ArtLib, RayLib
Spyglass	Transform
StageSoft, Inc.	StageSoft Accounting for small business product line
Structured Software	Faceterm
Summitpointe Technologies, Inc.	ASCWindows
Sunrise Software	Gul-builders, ezX
SYMARK SOFTWARE	SqueezePak, PakManager, Watcher, Distributed Disk Manager, Resource Manager Terminator-Plus & ChalkTalk
Symbolics, Inc.	Open Genera
Synergen	MMIS
Systech, Inc.	Systech, SPDS, AutoCAD
System Administration & Management	SMART
System Analysis Corporation	Clini-CAL Laboratory Information System, MacPath
	Anatomic Pathology/Cytology System, SBB-Blood Bank/Immunohematology System, Micro-CAL, Cline-CAL, Physician Results Reporting Module, Instrument Interface Module, Hospital Information System Interface Module
System Industries	Raider Disk Array Monitor Software, Automated Tape Librarian, aaSishadow Disk Mirroring Software
System Insights	Sidon
System Management	Remote Tape Facility, Dynamic Tape Accelerator, Dynamic Load Balances, RMS Expert
Systemetrics, Inc.	Sentry, PAGEmate, AudioToolkit
Tactics International Limited	Tactician, Buttons, Heavy Duty Tactician
Target Systems	Target-Hotline
TEAM ONE CONSULTING	Nullstone
The Wyndgate	Eden-QA SUBSYSTEMS
Thoroughbred	Basic, IDOL IV, Script-IV, Sourceror, Query-IV, SOLUTION-IV
Trinary Systems	EdWindows
TSI-Transportable Software International	TBL/VMS TBL/ALPHA
U.S. Design	Optical Superstar for Optical Products
Unifac Corporation	Unifac
Unifrac Corporation	PRAXA
Universal Technical Systems	TKSolver, Roark & Young on TK, Heat Transfer on TK, Dynamics & Vibration Analysis
Viking Software Services, Inc.	Portal
VSA Applied Computer Solutions	VSA-3D, 3-Dimensional Tolerance Analysis
VTH-Virtual Technologies Incorporated	Sentinel
W. Quinn Associates, Inc.	Q-Files, Menu, DQRILL, QPress, File/UNIX
WordMarc	Wordmarc, Linkmarc
Z/MAX Computer Solutions, Inc.	Z/MAX Xchange, Current X/change Retail Pricing, Z/MAX Computer Solutions

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Workgroup Computing

Compuware Corp. has introduced EcoScheduler, a member of the EcoSystems family of client/server systems management software.

According to the Farmington Hills, Mich., company, EcoScheduler lets users schedule batch jobs for the enterprise based on calendar events, the status of other jobs and resource use in an open systems data center.

The product provides integrated management of networks, operating systems and databases, addressing production support for mission-critical applications.

Features include flexible scheduling, complete schedule control and limits on resource consumption. Version 1.0 is scheduled for shipment in January.

Prices for EcoScheduler start at \$8,000.

► **Compuware**
(313) 737-7300

XLI Corp. has introduced the Image Xpert Network Print Server, a product that creates an integrated, high-performance printing system.

The product manages, stores, processes and transmits image-intensive data.

According to the Woburn, Mass., company, the Image Xpert Network Print Server consists of an Intel Corp. 1486-based computer, built-in Ethernet/LocalTalk capability, a 245M-byte hard disk, XLI's Image Xpert 5000 plain paper imagesetter, Zenographics SuperPrint and Zenographics Zscript PostScript Interpreter.

Available for Windows and Macintosh users, the Image Xpert Network Print Server costs \$10,995.

► **XLI**
(617) 932-9199

Computron Technologies Corp. has announced that N-Dimensions financial software and EPIC imaging and workflow systems are now available for Informix Corp.'s relational database.

According to the Rutherford, N.J. company, the partnership blends Informix's client/server database and Computron's advanced Level 3 client/server architecture, allowing individual application functions and processes to run on either the client or the server pieces of a computing environment.

Computron applications run on Unix servers such as Hewlett-Packard Co.'s HP 9000, IBM's RS/6000 and Digital Equipment Corp.'s Alpha AXP as well as IBM's AS/400, Digital's VAX and HP's 3000 legacy systems.

Pricing is based on a module basis starting at \$30,000 per module.

► **Computron Technologies**
(201) 935-3400

Business Objects, Inc. has announced BusinessObjects for Unix Motif and BusinessObjects for Unix Character, designed to provide complete information access, analysis and reporting solutions on an enterprise-wide basis.

According to the Cupertino, Calif.,

company, BusinessObjects for Unix Motif supports the Open Software Foundation's Motif user interface and can be deployed in two different configurations: on Motif workstations that are attached to a Unix database server or on Unix-based servers that are running Motif with users accessing the data through X11 terminals.

BusinessObjects for Unix Character is a character-mode implementation of BusinessObjects.

The User Module, the end-user version of BusinessObjects, costs \$595; the database administrator version, the Manager Module, costs \$3,495.

► **Business Objects**
(408) 973-9300

Product short

AFIC Technologies, Inc. has announced the Multi Server Option (MSO), a database replication system designed to de-

liver fault tolerance, disaster recovery, high availability and a broadcasting platform. The product allows an unlimited number of users to simultaneously access the same database from any server, in any location. MSO provides zero downtime and reduced response time. The product is available on Sun Microsystems, Inc. and Hewlett-Packard Co. platforms. Cost: Ranges from \$6,400 to \$26,000. AFIC Technologies, New York (212) 406-2503.

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IDC Insight

INTERNATIONAL DATA CORPORATION

New Cost-to-Use Analysis Key to E

Sponsored by IBM Appli

IDC has developed a better method of evaluating costs of computing. Price/performance numbers based on hardware benchmarks are often extremely poor predictors of the actual computing costs users will face. This is especially true in situations where customers are distributing very complex workloads across an enterprise.

Hardware price-performance benchmarks such as TPC-A provide solid, base-level comparisons in specialized environments. They don't reflect the complexity of most users' business needs and processing workloads. Therefore, they have limited value in making realistic buying decisions.

To help IS management better predict the true cost of computing, International Data Corporation (IDC) developed a "cost-to-use" model. This model is intended to more accurately measure and compare the full costs of using four types of leading midrange systems in networked, enterprise-wide applications. The systems in the study were: IBM AS/400, DEC VAX VMS, HP UX, and NetWare LANs.

Contradicts Price-Performance Notions

IDC studied more than 150 commer-

cial computer installations in the United States. We interviewed more than 30 customers who have installed networked-enterprise systems to assess the full range of computing costs in complex, enterprise-wide environments. The model IDC developed from this research includes hardware, system software, application software, development-staff and operations-staff costs, and all overhead costs associated with remote-systems management performed by a central site over a five-year period.

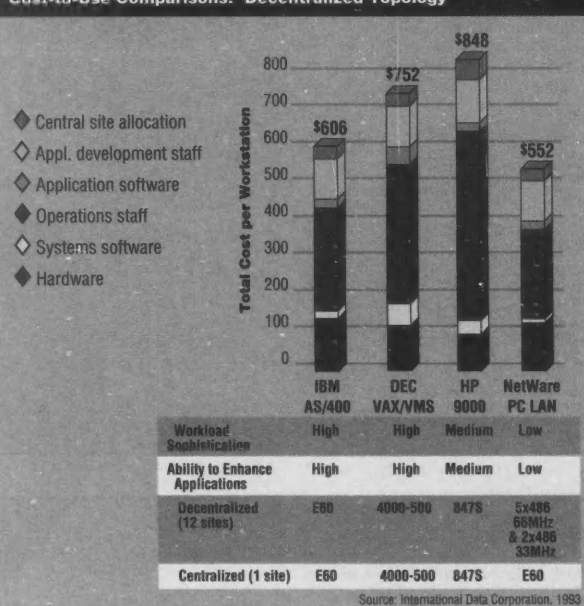
IDC believes the results of this study provide IS professionals with the best information available on the costs of processing in the most-complex type of computing environment, the networked enterprise. While we doubt that the results of the study will come as a major surprise to those who have fully considered the issues, our data contradicts notions based simply on hardware price/performance figures.

Options

Four major options appear to be available to PC LAN users.

1. Do nothing, and continue to live with existing distributed or decentralized topologies and functional-

Cost-to-Use Comparisons: Decentralized Topology



ity as they currently exist.

2. Wait for LAN vendors to deliver the needed functionality.
3. Add to operations staff, even though this will increase costs out of proportion to the increase in benefits.
4. Implement currently available technologies that provide the advanced functionality not yet available on LANs. While this may result in higher up-front costs, the IDC Cost-to-Use model indicates that this is the most-effective choice.

Staffing costs dominate

For example, consider the following:

- Integrated systems-management software services (a series of coordinated tools for administering local and remote systems) are a major differentiator for users because staffing expenditures dominate overall cost in the networked enterprise.

In a distributed topology, operations-systems staffs for IBM AS/400 and DEC VAX systems cost

\$36 per workstation per month, roughly a tenth of the cost of a LAN-based system. In a decentralized topology, as opposed to distributed, the reverse is true — LANs had the lowest costs for operations staff at \$244 per workstation per month. However, IDC believes these staffing costs are likely to rise during the next two years as the LAN-based applications mature and require reworking.

- Users — even IT professionals — generally lack experience with networked enterprise topologies. The logistics of distributing new software, software updates, physical and electronic support services, and hardware in a networked enterprise are viewed as a major barrier to success. As a result, few users are taking full advantage of the possible benefits of complex, distributed processing.
- The application set on LANs tends to be less-sophisticated than those on minicomputers. Development resources available for minicom-

Cost Components: Typical TPC-A Model vs IDC's "Cost-to-Use" Model*

Component	TPC-A	IDC Cost-to-Use
Hardware	CPU, memory, disk/tape, terminals, 5-year maintenance	CPU, Memory, disk/tape, terminals/workstations*, maintenance, depreciation
System software	Operating system, runtime database, transaction processing monitor, minimal networking, 5-year software maintenance	Operating system, development database, system management tools, transaction processing monitor, compiler, robust LAN for mixed clients (terminals and PCs), SNA-based WAN connections, 5-year software support
Operations staff	None	Manager, operators, technical support, specialists (PC, communications and security), help desk, administrators (DBMS and LAN), outside services
Applications software	None	Accounting, office automation, PC services, and support
Applications development staff	None	Manager, programmers (database, systems, and applications)

* Minicomputer-based topology included 60% PCs, 40% terminals. NetWare LAN-based topology included 100% PCs. Source: International Data Corporation, 1993.

Evaluating Networked Enterprises

Information Business Systems

puters often are considerably more sophisticated than those available for LANs. In response to rapid changes in business environments, we believe that many LAN-based applications in networked enterprises will require significant reworking in the 1993-1995 time frame as the environments move from support roles (i.e. file, print, and electronic mail servers) to full-fledged production applications (OLTP, database, accounting, and data analysis) computers.

- The IBM AS/400, sometimes mistaken as a premium-priced product, emerges as the lowest cost-to-use system in complex, networked, enterprise-wide processing environments.

The IT industry is currently investing heavily in distributed computing — and rightly so. Distributing processing power while retaining overall cohesiveness is an outstanding strategy for achieving the most pressing objectives facing IT professionals today: organizational effectiveness, better return on IT investments, increased productivity, and more-rapid exploitation of new technologies.

However, distributed processing is associated with significant complexity and uncertainty. Making the right decision requires higher quality, more-relevant information.

Conclusions

The information technology market is a very-complex place to shop. An expanding variety of hardware, software, and communications technologies, most associated with individual functional capabilities — that offer unique benefits — is being marketed by IT vendors to prospective and current customers. IT professionals demand better sources, quality and types of information to help them make the right decisions when planning purchases in this market.

Popular benchmark metrics such as TPC-A are specialized indicators of application performance (e.g. OLTP). As systems topologies get more complex, the appropriateness of this benchmark decreases dramatically. But TPC-C and the forthcoming TPC-D and TPC-E benchmarks will provide significant advances.

Users are exploring more-complex topologies as they attempt to support more-complex business strategies.

Two Types of Networked Enterprises

Type	Number of networked sites (+1 central site)*	End-user devices per site*	Primary objective	Best fit	Example
Distributed	115	16	Reduce operational costs by centralizing support and minimizing local IT resources	Multiple units, similar competitive conditions	Branch offices or franchises
Decentralized	12	150	Maximize operating unit flexibility, minimize infrastructure costs	Multiple units, dissimilar competitive conditions	Consumer goods or manufacturing

* Site size and end-user populations based on survey data. These qualities are used as the basis for all distributed and centralized analysis. Source: International Data Corporation, 1993.

The distributed enterprise and the decentralized enterprise, although more complex relative to traditional host-based, fully centralized configurations, are especially attractive to many companies. Comprehending options in these more complex settings, however, requires special costing tools.

IDC applied its Cost-to-Use model to help users better understand trade-offs between alternatives. From our research, the following conclusions emerged:

- Overall costs-to-use in networked enterprise are very dependent on staffing levels. Superior systems-software services allows users to minimize staffing levels at remote sites without also minimizing IT support and responsiveness.
- IBM's AS/400 and Digital's VAX VMS systems, largely because of their advanced system-software capabilities, are more attractive alternatives to LANs in sophisticated, networked OLTP enterprises. Moreover, our research indicates that IBM's AS/400's cost to use is superior even to Digital's VAX VMS offerings.
- The Hewlett Packard 9000 offers excellent pricing at the hardware level. It is being positioned to attack costs of complex topologies and staffing issues. Its vulnerabilities are in applications software and system software in distributed topologies. In decentralized topolo-

gies, HP displays a lack of sophistication in system- and network-management tools relative to IBM and DEC.

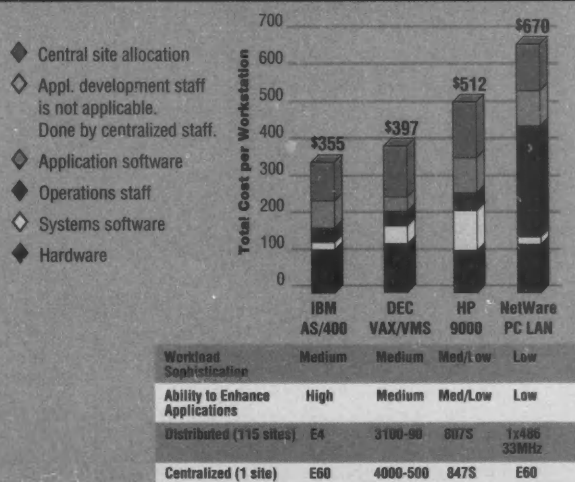
- As customers gain more experience with complex, networked enterprise topologies, they will (1) become more familiar with the logistics and politics of choosing, implementing and managing complex topologies, and (2) they will deploy these complex topologies more often.

Although we feel that the functionality of UNIX and LAN alternatives will increase over time, customers looking to take advantage of the benefits of networked enterprise topologies should strongly consider more integrated alternatives.

- Many users with LAN-based, decentralized enterprise topologies will be forced to choose between continued reliance on aging, less-sophisticated applications — and the potential competitive disadvantages implied by that choice — or greater staffing costs to rework and maintain their code base. We feel that they will have to choose more staff, despite the added costs, if they retain these topologies.

For a copy of the complete report, "Cost-to-Use of Midrange and PC LAN Systems in the Networked Enterprise," call 1-800-765-0119.

Cost-to-Use Comparisons: Distributed Topology



Source: International Data Corporation, 1993

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SoftSwitch fixes EMX shortcomings

By Lynda Radosevich

■ Initial releases of SoftSwitch, Inc.'s Unix-based electronic-mail integration system fell short in reliability and features, but recent and upcoming versions address those areas, according to a recently published study.

For companies combining independent E-mail platforms into one enterprisewide messaging network, SoftSwitch's mainframe-based messaging switch, SoftSwitch Central, is recognized by users and analysts as a market leader.

Its Unix-based product, called Enterprise Mail Exchange (EMX), uses X.400 messaging. EMX offers large users a migration path off the mainframe and provides small to medium-size companies an entry point.

Product profile		
History and projections for SoftSwitch's EMX		
Q3 '92	RELEASE 1.0 Initial offering	PROBLEMS: Administration, windowing, reliability and performance
Q4 '92	RELEASE 1.1 Access units, gateways, name rules, stable enterprise mail management	FIXES: Most administration problems addressed
Q3 '93	RELEASE 1.2 Directory synchronization server, Profs access unit	FIXES: Bugs resolved in windowing software
FUTURE RELEASES:		
Q1 '94:	RELEASE 1.3 - Additional directory synchronization clients	
Q2 '94:	RELEASE 2.0 - Interswitch protocol, multiswitch management, X.500 directory	

"While users said that early EMX releases suffered initial quality and performance problems, indications are that the current EMX 1.2 release has resolved the most serious reliability shortfalls," said the report's author, Daniel Blum, a principal at Rapport Communication in Tacoma Park, Md.

Better tracking

For instance, Don W. Price, a corporate messaging technologist at Texaco, Inc.'s 22,000-user E-mail network, said the initial EMX releases tended to lose connections. Now, "we've seen the software stabilized, and we've seen better diagnostic tools appear in later releases that help us track messages and audit the system."

To complete the report, Blum interviewed SoftSwitch experts, industry experts and seven large user sites with roughly 20,000 to 30,000 E-mail users and five to 10 different E-mail brands.

The most surprising discovery of his research was that users said they were generally happy with SoftSwitch's EMX support, Blum said. That countered earlier negative feedback about the SoftSwitch Central support because "the mainframe platform is harder to support," he added.

EMX is a combined software/hardware system that receives incoming messages from LAN, midrange and mainframe E-mail systems and value-added networks via access units. Access units are software modules that translate the protocols from the initiating systems. From there, messages are passed through a Message Transfer Agent and routed to remote recipients.

One of EMX's greatest strengths, according to Blum's research, is its built-in multiprotocol support for X.400, Simple Messaging Transport Protocol (SMTP), System Network Architecture Distribution System and

SoftSwitch, page 77

User ATM plans in sync with vendor progress

By Joanie M. Wexler
ROSEMONT, ILL.

Data communications veterans who have high hopes for Asynchronous Transfer Mode (ATM) but worry that it might suffer the Edsel-like fate of Integrated Services Digital Networks (ISDN) or Open Systems Interconnect (OSI) can probably relax.

Unlike those cart-before-the-horse technologies, the much-hyped ATM, a functional blend of circuit- and packet-switching networks, already has user interest that stretches way beyond the academic. So said a group of information systems executives at a Corporate Association for Microcomputer Professionals (CAMP) conference here earlier this month.

Attendees said they are busy lining up applications for the still-unproven but promising networks; meanwhile, vendors and carriers are scurrying to resolve standards issues and

offer products and services to both fuel and meet demand (see story page 79).

In a CAMP forum, attendees quickly stepped up to the plate to rattle off ways they would use ATM — a high-speed LAN/WAN technology optimized to mix data, video and voice — provided they can resolve infrastructure migration challenges.

For example, Melissa Faun-Bull, a network planner at Northwestern University in Evanston, Ill., is working to get all dormitory students onto an ATM network so they can send "live" term papers incorporating text, images and even video attachments to their professors on-line. She said the university will likely leapfrog interim technologies such as switched Ethernet for ATM because its network infrastructure needs up-



ATM forum moderator Kenneth Zoline: Cable TV/phone company partnership plans hinge on ATM

grading anyway.

Meanwhile, Hill Wolfe, a network technologist at the Chicago Board of Trade, said he an-

ATM, page 79

Mary J. Cronin

Exploring the Internet



Most businesses connected to the Internet are using only a small fraction of their resources. After being "lost in cyberspace" a few times, many network users confine themselves to a few familiar pathways, thereby

missing out on some of the greatest benefits of global connectivity.

Adventurous Internet veterans know that the network's discussion groups offer great shortcuts to specific information or expertise. At their best, Internet groups provide a forum for experts from around the world to collaborate on problem-solving. Business users can post questions on almost any topic — system integration, total quality management, government policy or international trade — and can count on receiving knowledgeable answers.

There is an art to getting the most from Internet discussions, however, beginning with selecting the right groups. A "List of Lists," avail-

able on-line from the InfoSource (telnet to is.internic.net and search under "discussion groups") or in hard copy from SRI International (send E-mail to nisc@nisc.sri.com), describes thousands of special interest groups accessible through the Internet. Choices relevant to business range from finance, marketing and personnel administration to management policy, technology and networking.

Narrow your choices

Another challenge is winnowing out just the bits you want or need from the massive amount of information available. Participating in even a handful of high-volume discussions can quickly translate into hundreds of E-mail messages daily, creating an intolerable amount of "noise" on the desktop. Organizations participating in Usenet, the largest collection of discussion groups, often choose to deal with this by limiting the number of groups received or the amount of time messages are stored.

The first line of defense for individuals is "newsreader" software that stores a profile of the specific groups of interest, then screens and sorts the messages for convenient reading. This allows users to browse through many potentially valuable discussions, selecting items of interest. Such software is freely available on the Internet for a variety of workstations and network configurations. The group called news.software.readers is a good place to find it.

Another technique is to begin with the most narrowly focused groups and ask participants

Cronin, page 77

X windows lead the way to open systems

Companies struggle to migrate legacy mainframe applications to low-cost open systems computers



By Jean S. Bozman

X windows are a mirror on a company's computing infrastructure. Originally intended as a

way to view applications in a Unix network, the X Window System is becoming the information systems manager's ally in migrating from legacy mainframe systems to distributed open systems.

By running the X Window System on Unix workstations, X terminals and even PCs and Macintoshes, IS managers can distribute shared applications across a network.

The trick of the X data management technique is this: Any X window can display the same information in exactly the same way, as long as it is written to X11 windowing standards from the X Consortium in Cambridge, Mass.

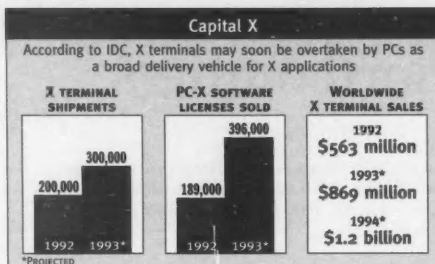
Users at large sites report they are us-

ing X windows to display mainframe and Unix applications side by side on the same screen. Users can transfer data from one X window to another by cutting and pasting—forging a link between two incompatible computing environments (see story below).

Good migrations

"It's a great migration strategy," said John Morrell, a Unix research analyst at International Data Corp. (IDC) in Framingham, Mass. "It allows you to use the network to distribute applications, allowing users to get simple access to those host-based applications without having to wait for the software vendors to rewrite them."

That will give corporate developers many months, or even years, to write new applications for use in a client/server network, he said. "You don't have to take a huge leap of faith to go from completely centralized host applications to com-



pletely distributed ones," Morrell said.

"Our goal is to replace the IBM 3270 environment entirely with an X environment, but the problem is you can't get there in one step," said Bruce Campbell, project manager at BC Tel, a telecommunications firm in Burnaby, British Columbia. "The conversion job is huge, and it will take so long to do it that we have agreed to take an evolutionary [approach], taking it step by step."

By using X Window System technology, users in mainframe shops are taking the first steps toward client/server technology, industry analysts said.

X terminals can present a colorful graphical user interface to the user, even though the computational work load is run on a Unix workstation across the network. Some models, such as Hewlett-Packard Co.'s recently introduced Envizex line, are outfitted for multimedia, including voice annotation and shared whiteboard software.

Space saver

X terminals can also save on desktop space, said Jim Stikeleather, director of systems development at Kash n' Karry Food Stores, Inc. in Tampa, Fla. "People have an X station on their desk instead of a PC, an IBM 3270 terminal and a Unix workstation," Stikeleather said.

Kash n' Karry has more than 150 Network Computing Devices, Inc. (NCD) X terminals and more than 20 Sun Microsystems, Inc. servers in its network, as well as mainframe applications, according to Stikeleather. "We're re-engineering so that as functionality appears on the Unix side, it disappears off the mainframe."

The move to rewrite legacy applications for client/server networks at such sites is one reason why X terminal sales are growing, said Eileen O'Brien, director of terminals research at IDC. Legacy applications were generally expensive to develop but were known for reliability proved through decades of use, she ex-

plained. Now, "people want to compare the numbers in the legacy applications and the new applications."

A further sign of the trend to mix and match legacy and new applications is a wave of IBM 3270 support on X terminals provided by NCD, Digital Equipment Corp.,

Tektronix, Inc. and NCR Corp., O'Brien said.

The X terminal market is growing, with shipments expected to rise from about 200,000 in 1992 to nearly 300,000 this year, O'Brien said (see chart).

Benefits abound

IS managers have found important operational benefits from using X Window System technology: reduced costs, increased data security and improved software administration due to centralized hosting of shared applications. Another benefit is the ability to present a single

software application consistently, whether it is viewed from a PC or a workstation.

Central-site management of distributed applications is a valuable consequence of using the X Window System, said Terry Bennett, an analyst at

Computer Intelligence/InfoCorp in Beaverton, Ore.

"You only change the software if management lets you do it," said Bennett, who noted that many X terminals do not even have a floppy disk drive, ensuring that data cannot be removed. Large corporations, including Chevron Corp., Ford Motor Co. and Wall Street brokerages, use X terminals as part of an open systems mix, lowering the overall cost of distributed systems and gaining security through centralized backups.

Expense has become one of the leading drivers of X Window System use, along with concerns about data integrity and software management, users said.

"It's a lot easier to license and keep track of software because it's on a few machines," said Mark Anderson, a computer scientist at

the Advanced Photon Source research project at Argonne National Laboratory in Argonne, Ill. Anderson estimated the ratio of X terminals to Unix workstations at his site to be 1-to-10 but added that the number of X terminals at the laboratory is still growing.

Where mainframe and Unix converge

X terminals are the link between the old world of mainframes and the brave new world of open systems computing at some sites that are re-engineering mainframe systems. From a user's point of view, the old and the new world come together on screen, where mainframe applications appear in some X windows and Unix applications appear in others.

BC Tel, a Canadian telecommunications firm, must link legacy applications with new ones on dozens of IBM RS/6000s scattered at 23 locations throughout the province. BC Tel plans to keep its mainframes in place indefinitely as a database repository.

Mixing and moving

Day-to-day operations must mix data from mainframes and Unix servers. "We're trying to get these folks to move from a character-based system [on the mainframe] to one where we could add more functionality," said Bruce Campbell, project manager of the Enhanced Customer Contact and Opportunity for Service system.

"We're putting a gateway between the graphical presentation of the world and the legacy IMS database on the mainframe," he said. "We chose X because it looked as though it was going to survive the standards wars."

BC Tel acquired 650 IBM Model 130 X terminals last year, Campbell said. Development work for the X Window System project began in July 1991 with a team of 10 programmers, and the first Unix applications were deployed this summer for 1,000 users.

Now, the familiar technology of IBM 3270 terminals—which only displayed one mainframe session at a time—is fused with Unix database applications on RS/6000 servers.

Users are able to peruse up to eight "rooms" on their X terminals, which all have the HP Visual User Environment desktop interface. Some rooms hold Oracle Corp. database applications written for the Unix servers, Campbell said. Others hold central-site inventory data stored in an IBM mainframe's IMS database.

Doing its own thing

Kash n' Karry Food Stores is doing something similar but is trying to re-engineer mainframe applications to an open systems environment much more quickly. The 120-store grocery chain has taken the unusual step of creating its own object-oriented language—a superset of C++—and turning Sun Unix servers into object-oriented repositories for corporate information.

At Kash n' Karry headquarters, about 150 desktop X terminals host X Window System applications and do the work of individual PCs and Unix workstations by hosting shared applications. It is one step on the road to a complete switch to open systems operations, planned for 1996.

"We're trying to get to a point where Unix systems will be delivering all of the operations and actionable information we need to run our business," said Jim Stikeleather, director of systems development.

—Jean S. Bozman

A further sign of the trend to mix and match legacy and new applications is a wave of IBM 3270 support on X terminals.

The X protocols, developed in the 1980s at MIT and now managed by the X Consortium, define the mechanism by which a terminal, workstation or PC displays graphical information. That is why X windows can push shared applications across networks, no matter what type of computer is at the other end.

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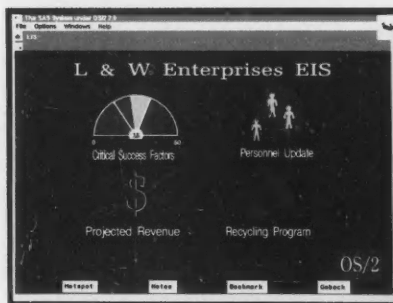
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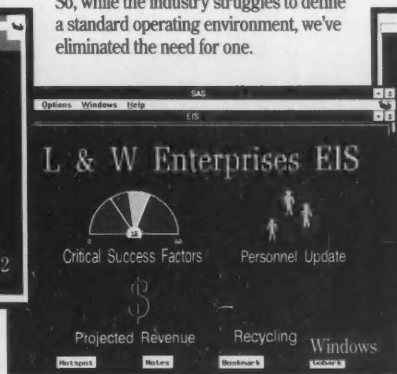
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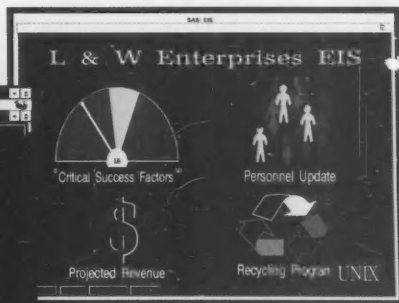


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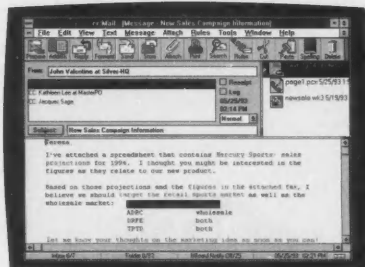
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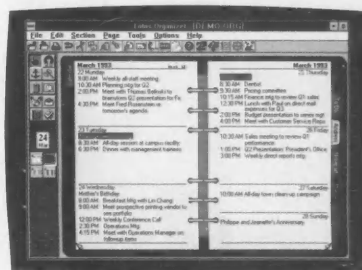
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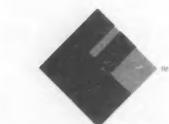
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CONTINUED FROM PAGE 71

SoftSwitch's System Network Architecture Interface.

Other access units, such as for CC:Mail and Microsoft Mail, are separately available from SoftSwitch.

"The protocol support is very important. We're using SMTP, Distributed Office Support System [IBM mainframe] and CC:Mail access units to integrate three platforms," said Jeff Jones, a director of information technology at the Swiss Bank Corp.'s Chicago office. Swiss Bank has been using EMX since March to integrate E-mail systems supporting roughly 23,000 users.

Other EMX strengths highlighted in the report include rules-based names transformation to help solve nasty addressing problems when sending messages between E-mail systems with different naming schemes. Another strong suite, directory synchronization capabilities, has been promised, but the users Blum contacted had not received the software yet. Also, a graphical management

user interface, support for symmetrical multiprocessing and mail monitoring capabilities are high points.

One drawback is that there is no support for the X.500 directory protocol yet, according to the report.

"In many cases, that is not a weakness, but among Fortune 500 and government users, there is a small but growing percentage of users that want to be early X.500 adopters," Blum said.

For instance, Jones said the X.400 and

X.500 standard seem to be the way to keep E-mail systems in the mainstream so they can interoperate with products in the future. SoftSwitch said it plans to add X.500 support in future releases.

Also, it is difficult to discover up front how EMX will perform because SoftSwitch does not publish benchmarks, and in multiprotocol scenarios, the company's published performance "goals" are not met, Blum said.

Blum's research also found that EMX

propagates directory changes made in local systems by local E-mail administrators, but does not allow central administration of the enterprise directory.

At Texaco, local administrators complete most directory information changes. However, central administrators can make changes to fix routing errors. Although Texaco is using homegrown directory synchronization software, Price said he plans to move to EMX's version, and he requires some central control.

Cronin

CONTINUED FROM PAGE 71

to recommend other related topics. The "comp" or computer-related category of Usenet, for example, includes more than 400 distinct groups on topics such as client/server technology (comp.client-server), networking IBM mainframes (comp.protocols.ibm) and Unix-based systems (comp.unix.admin). Operating tips and new solutions are offered in vendor and product-oriented groups focused on a particular type of hardware or software. Postings are often archived on a host computer, where they can be consulted and downloaded as needed.

Usenet groups such as comp.sources.reviewed and alt.sources also open doors to another Internet business resource: free and public domain software.

Cronin is university librarian at Boston College where she manages a highly automated networked information service and teaches a graduate course on international perspectives on information management. Her book, *Doing Business on the Internet: How the Electronic Highway is Transforming American Business*, was published by Van Nostrand Reinhold.



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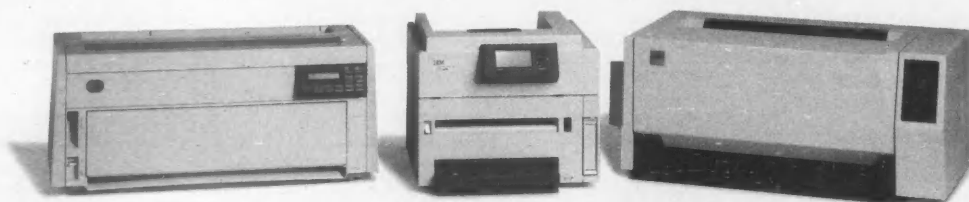
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User, vendor ATM plans in sync

CONTINUED FROM PAGE 71

anticipates less flashy initial uses for the technology: "It solves throughput problems, and that payback is usually justified in the backbone first," where the exchange would likely get started with the technology, he said.

Because ATM specifies fiber-optic cabling as its medium, users with copper wiring throughout much of their enterprises are likely to start with the backbone, where fiber is more prevalent, he said.

Issues still to be addressed

Products to accommodate such applications already exist in the form of switches from companies such as Adaptive Corp., Fore Systems, Inc. and SynOptics Communications, Inc. However, interoperability among vendor products, congestion control schemes and blending ATM with today's shared-medium LANs must still be resolved, said conference speaker Kenneth O. Zoline, president of Kenneth O. Zoline and Associates, a networking consultancy in Chicago.

Meanwhile, other users said the technology should simply deliver cheaper bandwidth: Mixing various applications over one service rather than running them over separate circuits means the economies alone should eventually play out.

And the ballyhooed interactive services on the drawing board by phone and cable company partnerships, including the recent Telecommunications, Inc./Bell Atlantic megamerger [CW, Oct. 11], will rely on ATM technology, Zoline said.

Such situations, in which users are carefully plotting where and how they will deploy the

technology, diverges from the histories of ISDN, OSI and even Fiber Distributed Data Interface (FDDI). It has taken years for users to figure out applications to justify ISDN, for example; however, the killer use may finally be arriving in the form of the telecommuter and remote user.

With OSI, it will simply take much longer than expected to make the networking standard ubiquitous at all levels — and thus useful — to most organizations.

Bogged down in the process

And FDDI missed a portion of its window of opportunity, largely because of the cumbersome formal standards process. ATM is circumventing that problem by assembling a much more nimble group of interested vendor and user parties known as the ATM Forum. The forum has been nailing down preferred standards pieces, which it then presents to the formal T1/S1 standards body under the auspices of the CCITT.

"It solves throughput problems, and that payback is usually justified in the backbone first."
— Bill Wolfe, Chicago Board of Trade

Users expressed confidence that the networking community has learned from its mistakes and that ATM is a network that will hit the mark. One user said his hospital is already undergoing the infrastructure revamp required to support ATM and awaits imminent hospital diagnostic and imaging applications.

Another user said his firm is looking ahead to interactive video, combined with collaborative computing, simply to cut down on travel costs, as intracompany personnel become more geographically dispersed and on-line collaboration with business partners picks up.

"There's software today for this kind of activity but not the bandwidth" to render it mainstream, which ATM should provide, he said.

Regional Bells do their part

US West recently became the latest regional Bell operating company (RBOC) to cite plans for ATM service. RBOC deployment of ATM is necessary for filling the segment of an enterprise ATM network running on local public services.

Pacific Bell is the only RBOC slated to roll out service this year (December), though all reportedly have ATM trials in place. Meanwhile, US West's Advanced Communications Services division earlier this month mapped out a three-phase ATM program to stretch over the next two years, beginning with infrastructure deployment — which is nearly complete — and customer trials, to start next month.

The trial participants include an 11-company consortium in the Boulder, Colo., region and state universities and government agencies in Oregon.

At the end of 1994, US West will specify services based on trial findings, said Jerry Parrick, US West's vice president of customer solutions.

He said the following decisions have yet to be made:

- What network speeds to offer. For example, there is a controversy over whether ATM at T1 (1.5M bit/sec.) speeds and below is beneficial. This is because large chunks of ATM overhead make the technology — for which users will initially pay a premium — not worthwhile at lower speeds.
- Whether to offer variable- or constant-bit rate interfaces. Many ATM switches today cannot accommodate both functions.
- Whether pricing should be flat-rate, use-based or a choice.

"The definition of 'ATM service' isn't always clear," said Rosemary Cochran, principal at Vertical Systems Group, a consultancy in Dedham, Mass.

For example, she said, carriers can offer vanilla transport services, but those require ATM gear on the user's premises, and "there isn't much out there today."

Most carriers have indicated that they will offer ATM-specific applications instead; witness, for example, long-distance provider WorldTel's channel-extension service or MFS Datanet, Inc.'s LAN interconnect services, both based on ATM infrastructures.

—Joan M. Wezler

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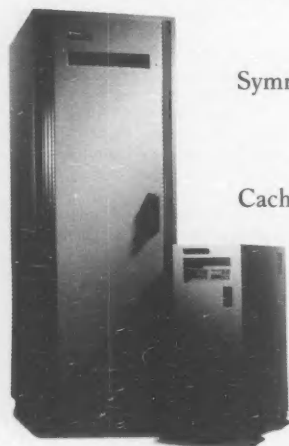
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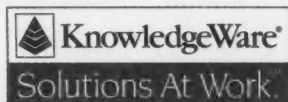
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Bell faces regulatory hurdles

By Ellis Booker

Well before Bell Atlantic Corp. and Telecommunications, Inc. (TCI) can merge or offer information age services, their merger will have to gain the approval of shareholders, the Federal Communications Commission, antitrust regulators and legislators on both sides of the aisle.

Unquestionably the most serious regulatory obstacle is the prohibition on regional Bell holding companies from offering long-distance services outside of their territories. That restriction, a major piece of the Modified Final Judgment (MFJ) ruling that broke up AT&T in 1984, would seem to be compromised by TCI's assets. With more than 20% of the U.S. cable customer base, TCI has 1,200 cable systems serving more than 10 million subscribers.

But a Bell Atlantic spokesman said the company will "move quickly" to seek waivers for the long-distance restriction, arguing that the MFJ rule does not address video signals and that "long-dis-

tance video signals do not intrude on long-distance voice services." Bell Atlantic said it plans to sell the 14% of TCI cable holdings that operate in Bell Atlantic's six state territory, thus avoiding anticompetitive claims. Bell Atlantic has not decided what it will do with New York-based Teleport Communications Group, Inc., a local-access bypass provider in which TCI has a 30% ownership.

Video content allowed

In a related event last month, Bell Atlantic won a precedent-setting victory in a federal appeals court in Alexandria, Va., which ruled the company could provide video content as well as transport over its network. Bell companies have been prohibited under the 1984 Cable Act from providing video programming.

Bell Atlantic has long-standing interests in cable TV and is testing a technology called Asynchronous Digital Subscriber Loop to pump compressed video signals over a twisted-pair wire to about 300 to 400 subscribers in Arlington, Va.

New Products

Haven Tree Software Ltd. has introduced Nodemap Version 2.0, a software program that automatically updates Novell, Inc.'s NetWare network diagrams.

The product is a DOS-based, Windows-compatible program that employs a series of standardized shapes and icons to consolidate system information and create graphic representations of complete network configurations, according to the Kingston, Ontario, company.

Features include an "intelligent" line router and a text formatter.

Nodemap 2.0 tracks interconnected printers, file servers and workstations and supports more than 270 output devices.

Nodemap 2.0 costs \$299.

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Advanced Digital Information Corp. has introduced the Virtual Library Systems-8 (VLS-8) system, a 110G-byte, 8mm autoloader.

The product employs Exabyte Corp.'s half-height EXB-8505 8mm tape drive. The union of VLS-8's 11-cartridge magazine and the EXB-8505 running in data compression mode offers an unattended capacity of 110G bytes for network backup and data management applications, according to the Redmond, Wash., company.

A front control panel provides a full range of library control and diagnostic functions.

The single-drive library is priced at \$14,500. The fully configured, dual-drive library costs \$20,900.

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Optical Data Systems, Inc. has introduced the ODS Infinity 1100-FL10 and

1100-FL20 fiber-optic series of 10BaseFL stand-alone hubs.

The products support either 10 or 20 10BaseFL ports in a compact 3½-in. rack mountable unit, according to the Richardson, Texas, company.

The series also supports an additional optional port of either 10BaseFL or AUI. Management options include support for all nine Ethernet Rmon groups and advanced Simple Network Management Protocol.

Prices for the 1100 Series 10BaseFL hub start at \$3,600.

► **Optical Data Systems**
(214) 234-6400

Hayes Microcomputer Products, Inc. has introduced the Hayes JT Fax 14400B Dual, an internal dual-port fax board.

According to the Atlanta company, the product supports Group 3 fax speeds of 14.4K bit/sec. and full-featured digital voice capability.

The product can be used in gateway or LAN fax server applications and for fax on demand.

The fax board comes equipped with two dedicated fax and voice units.

The Hayes JT Fax 14400B Dual costs \$699.

► **Hayes Microcomputer Products**
(404) 840-9200

Product short

21CenNet, Inc. has announced MobileWare, a software system. The product allows mobile professionals to connect with their corporate computing environments over wireless and traditional land-line telephone networks. Users can send and receive files, faxes, electronic mail and printed documents in compressed and encrypted form. Cost: begins at \$500 for a single-user system. 21CenNet, Richardson, Texas (214) 690-6181.

Briefs

Chip deal

On the eve of the appointment of former **Apple Computer, Inc.** Chief Executive Officer John Sculley, cellular modem patent-holder **Spectrum Information Technologies, Inc.** in Manhasset, N.Y., said it licensed its technology to **Rockwell International, Inc.** in a deal with codevelopment and marketing ramifications. According to Spectrum, the two companies will develop chip sets incorporating its technology. The chips will be used in portable computers, personal digital assistants and personal communicators.

App gets wireless link

XcelleNet, an Atlanta maker of software tools for automating transaction-based business processes in remote and mobile computing environments, will reportedly soon offer a link to the **RAM Mobile Data** wireless messaging network in its **RemoteWare** product. Roving users would gain wireless access to information housed in home-office databases, such as customer order numbers, inventory levels and account status, the companies said.

New Cisco distributor

Router maker **Cisco Systems, Inc.** said **Ameritech Corp.** will begin distributing Cisco's entire internetworking product line in conjunction with Ameritech's network integration and remote network management services.

Phones to get 'smart'

Tandem Computers, Inc. has agreed to sell **VeriFone, Inc.** "smart screen" telephones to act as intelligent interfaces to Tandem servers. The phones, expected in mid-1994, will include a screen display, keyboard, modem, magnetic strip card reader and system software for automating card-based transactions.

Expediting FCC licenses

With eyes on the sky, two companies with planned worldwide low-earth satellite networks have petitioned the Federal Communications Commission to accelerate the licensing process for this technology: **Motorola Satellite Communications, Inc.** and **Loral Qualcomm Satellite Services, Inc.** filed a joint proposal with the FCC.

Nextel billing streamlined

Computer Sciences Corp. (CSC) signed a \$25 million contract to provide **Nextel Communications, Inc.** with a system that lets Nextel send customers one bill for different kinds of cellular services such as paging, phone and voice mail. Also, the system will help track inventory, customer communications and marketing, according to CSC.

Reuters turns to paging

Reuters America, Inc. will use **Motorola, Inc.**'s one-way Embarc messaging network to deliver financial, business and general news to mobile computer users, the two companies said recently.

ObjectView Tech Talk

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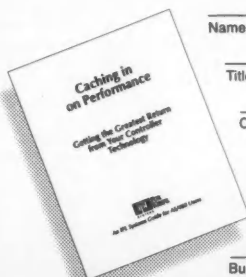
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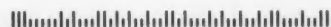


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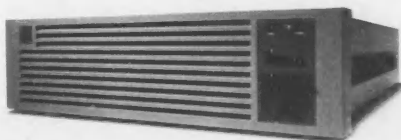
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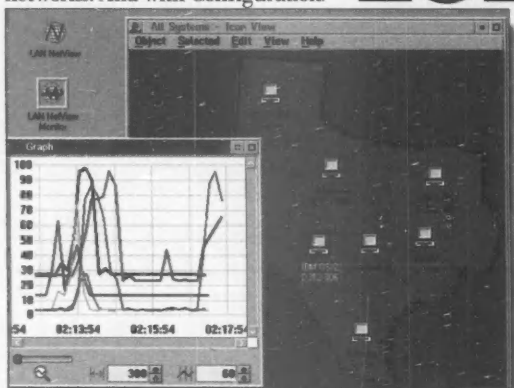
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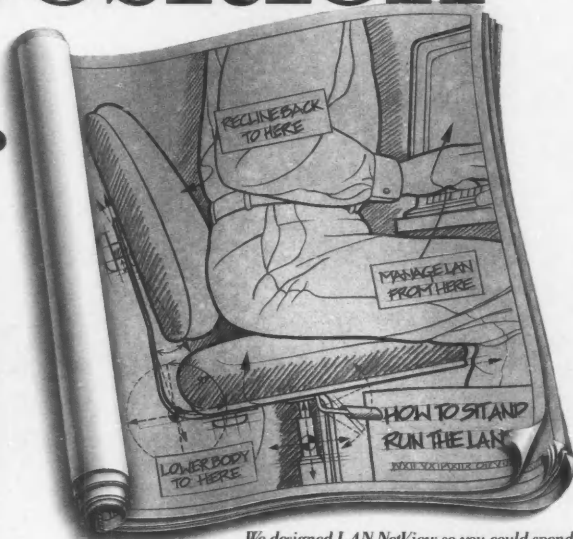
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Large Systems

VAX shares Digital's attention

By Craig Stedman
MAYNARD, MASS.

Digital Equipment Corp. may be in the throes of "Alpha-holism," a term that International Data Corp. analyst David Smith uses to describe Digital's emphasis on its new Alpha AXP computing technology. But the company is not letting the tap run completely dry on its venerable VAX systems line.

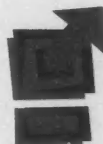
VAX machines still outsell their ramping-up Alpha cohorts by a wide margin, according to Digital executives. As a result, while the hardware portions of the company's Oct. 12 product blitz focused mainly on Alpha workstations and servers, the VAX got more than a passing mention.

Digital revamped the low-end workgroup and departmental members of the VAX family, adding five new MicroVAX 3100 and VAX 4000 models (see chart). It also said that a complete overhaul of the VAX line is in the works, from the workstation level up to the VAX 10000 mainframe-class system.

Alpha's next

While the VAX architecture is not being dead-ended, Pauline Nist, vice president for Alpha and VAX servers, said Digital has no plans to develop any all-new VAX microprocessor designs beyond the current NVAX technology. "Alpha is essentially the next microprocessor" for VAX users, she said.

The VAX systems introduced two weeks ago include one machine, the VAX 4000-700A, with an NVAX processor sped up to 100 MHz from the previous maximum of 91 MHz. The other



No big gains

Despite the addition of the Alpha AXP line, Digital officials acknowledged that the company has not yet started gaining back the workstation market share it lost in recent years. "But certainly we would expect now that this will begin to happen," said William Demmer, vice president of Digital's computer systems group. The Alpha machines were held back by a lack of applications but are supported by "an adequate number" at this point, he added.

new models expand on earlier hardware, primarily by means of increased I/O throughput, Digital indicated.

Nist said Digital will likely do an optical shrink of the NVAX device for the next generation of VAX machines, which should allow clock speeds to be increased beyond the 100-MHz mark. The company also is looking at increasing the memory caches included with the processors, she added.

Terry Shannon, an analyst at D. H. Brown Associates in Port Chester, N.Y., said an optical shrink would be the cheapest way for Digital to expand the VAX line. The overhaul is expected within the next year and should appeal to users who "are not yet willing to migrate" to Alpha, he said.

"People are still buying first-time VAXs," added Wes Melling, a Gartner Group, Inc. analyst in Stamford, Conn. Melling noted that the new low-end VAX machines actually did better than Alpha systems in transaction-per-second cost on TPC-A benchmarks run by Digital prior to the recent rollout.

The VAX line remains central to the purchase plans of some Digital customers. Dave Federman, vice president of systems and planning in the broker/dealer services department at Chemical Banking Corp. in New York,

said VAX machines are still "our bread and butter" computing platforms.

"From our point of view, it's too early to think about Alpha," Federman said, citing a continuing lack of key layered software packages.

PacificCare Health Systems, Inc. in Cypress, Calif., will probably not move to Alpha in a serious way for another year or more, said Matt Holdrege, senior network specialist at PacificCare. The company recently bought VAX machines and is open to getting more if business growth makes that necessary, he noted.

Other users have closed the door on VAX, however. The ongoing VAX development "is to DEC's credit, but we're only going to be doing Alphas," said Tim Bird, director of information services at Paws, Inc. in Muncie, Ind. "Alpha is a faster box and it's definitely the future of DEC."

"They're putting more VAXs out for the customers who can't move to Alpha yet, but I can move most of my production and that just makes a lot more sense than trying to stick with the VAX," said Bob Cloninger, data processing manager at OK Industries, Inc. in Fort Smith, Ark.

Just the VAX

Digital's new VAX server lineup for workgroups and departments

	CPU clock speed	TPC-A performance	Maximum I/O bandwidth	Entry price
MicroVAX 3100-90	72 MHz	86 tps	4M byte/sec.	\$19,530
VAX 4000-100A	72 MHz	96 tps	16M byte/sec.	\$31,180
VAX 4000-500A	72 MHz	117 tps	20M byte/sec.	\$46,540
VAX 4000-600A	83 MHz	184 tps	20M byte/sec.	\$68,540
VAX 4000-700A	100 MHz	254 tps	20M byte/sec.	\$85,340

Source: Digital Equipment Corp.

Impatient Legent to build own DME

By Gary H. Anthes
HERNDON, VA.

No longer willing to wait for the Open Software Foundation's (OSF) much-delayed Distributed Management Environment (DME), Legent Corp. has announced plans for building a DME of its own.

Legent's strategy will bridge hosts and client/server systems through a suite of systems management products, middleware, application programming interfaces (API) and development tool kits. As such, it spans Legent's product line, encompassing multiple operating systems, including MVS, Unix and OS/2.

Legent said its approach — which builds substantially on technologies from other companies — will allow users to reduce staff costs and improve systems reliability by simplifying resource management, software development and distribution, troubleshooting, backup and recovery and user administration across heterogeneous environments.

The strategy, dubbed Cross-Platform

Environment (XPE), pulls together under one architecture a number of initiatives started during the past three years. Its announcement was prompted in part by a spate of bad news last summer that sent Legent's stock price tumbling and prompted users and analysts to charge the company with failing to keep them fully informed of its plans [CW, July 19].

XPE is no copycat

Legent Chief Executive Officer John Burton said the middleware, APIs and development tool kits in XPE will be used by Legent, its customers and by third-party software vendors. At the same time, he differentiated XPE from DME.

"DME was designed for Unix servers and desktops," Burton said. "What we've done is extend from the host all the way to the desktop those common services between platforms."

Burton said that although Legent is a member of OSF, it could not wait for the pieces of DME to roll out over the next year. Therefore, the company struck deals with others to produce its own tool

set. Nevertheless, DME and XPE will be complementary, and users will be able to mix and match both architectures.

The middleware components of XPE include user presentation services developed using graphical user interface technology from Visix Software, Inc. in Reston, Va., communications services based on Pipes technology from PeerLogic, Inc. in San Francisco, object services based on technology from Tivoli Systems, Inc. in Austin, Texas, and directory services.

Some XPE capabilities exist now, and most of the remaining features will emerge by the end of 1994, Legent said. In most cases, XPE functions are embedded in Legent's systems management products and entail no extra license fee.

Desperately seeking XPE

"When we heard about XPE we said, 'When? We need it desperately,'" said Lee Figliuolo, vice president of information systems operations at Progressive Corp. in Mayfield Village, Ohio, an insurance company that is moving to client/

server. "It saves me from having to do all that work." The alternative would have been for Progressive to develop its own middleware, APIs and tools.

Others were less enthusiastic. Bruce Allen, vice president at Meta Group, Inc. in Westport, Conn., said Legent is at least 18 months behind Computer Associates International, Inc. in its rollout of products for distributed systems management.

Allen, who said he had been extensively briefed on XPE by Legent management, said Legent's "buy vs. build" approach works against its claims for integration and interoperability. Legent will find it difficult to get the same interoperability that CA has achieved within its CA-Unicenter suite of system management products, he said.

One of the objectives of XPE is to allow users to transparently manage system resources across dissimilar operating systems using just one workstation. That idea was embodied in a limited way in Legent's recent alliance with Hewlett-Packard Co. to develop tools spanning mainframe and client/server environments for performance and resource management [CW, Sept. 27].

Sequent pushes the Pentium envelope

By Mark Halper
BEAVERTON, ORE.

■ Sequent Computer Systems, Inc. has driven its line of Unix multiprocessing minicomputers into the next dimension by unveiling its latest processors based on Intel Corp.'s Pentium chip.

Although Sequent did not release transaction processing benchmark figures, it said the new Symmetry 2000 models double the price/performance of Sequent's previous Symmetry 2000 line, which is based on Intel's i486.

Kevin Joyce, Sequent product manager for future systems, said the company achieved the performance gains by means of a more powerful processor. Sequent doubled the width of the I/O bus from 8 bits to 16 bits and used 3½-in. drives that accommodate 76 I/O requests per second, compared with 65 per second on the earlier 5¼-in. drives.

The new lineup

The Symmetry 2000/790, 2000/490 and 2000/290 scale up to 30 processors, 10 processors and 6 processors, respective-

ly, through two-processor boards housed in any of the Symmetry's 26 add-in slots.

Mike Higgins, technology support manager at Byer California and a beta customer for the Pentium box, said he expects to eventually move Byer to the new machines from its clustered 486-based Symmetry systems. Higgins lauded Sequent for doubling Symmetry's bus width, noting that a failure to do so would have crippled the I/O performance because the Pentium operates significantly faster than the 486.

"When you have 30 Pentiums in a machine, you better have a screaming I/O bus or you're going to throttle your processor," Higgins observed.

Sequent's move to 3½-in. drives was a

boon to performance because the smaller form factor means each drive in a fully stacked storage cabinet will reside closer to the system and thereby require less cabling. As cable distance increases, performance suffers, according to Higgins.

Dick Lund, vice president of information systems at Wausau Insurance Co. in Wausau, Wis., said he does not plan to rush out and replace his 486 Symmetry box with a Pentium unit.

"Right now, we have plenty of capacity," said Lund, who converted Wausau's pension management program from an IBM 3090 to a Sequent box running an Oracle Corp. database in early 1992.

More change

Furthermore, Lund noted, Wausau's parent, the Nationwide Group, is considering consolidating its pension management system with Wausau's, a move that could entail switching platforms again.

Joyce said Sequent is emphasizing sales of clustered configurations under the moniker Symmetry 2000/990. It is offering each of the models in a two-box clustered package.

With the move to 3½-in. drives, Sequent increased storage capacity slightly, to 806G bytes from 768G bytes. Mean time between disk failure also improved, to 500,000 hours from 300,000 hours, Joyce said.

Rivals cooperate

Sequent buys the 3½-in. drives from minicomputer rival Hewlett-Packard Co. Like Sequent's earlier Unix models, the Pentium boxes, which are available now, run the company's Dynix/ptx Unix operating system.

Prices range from \$83,000 to \$1 million, depending on the configuration and number of users. A Symmetry 2000/290 with two processors, 64M bytes of memory, 2G bytes of storage and a 16-user license is priced at \$85,500.

A Symmetry 2000/990 two-box cluster with two Pentiums per box, 64M bytes of memory, 6.2G bytes of storage and two 16-user licenses lists for \$271,900. This price also includes three Ethernet cards per system, a shared expansion cabinet, two copies each of ptx/Cluster, ptx/LAN and ptx/TCP/IP software, plus two weeks of training.

Unisys clears trail for migration to V series

Ports of Mapper development tool kit to run on four different platforms

By Thomas Hoffman
MINNEAPOLIS

Unisys Corp.'s promise to deliver a migration program from its older V series to its newer A series was warmly received by customers at the vendor's recent user group conference here, as were the company's plans to port its Mapper development tool kit.

The Mapper ports will enable Unisys mainframe applications to run on Windows-based

Mike Deneen, a director of product marketing at Unisys' U.S. division.

EVA Terminal Coexistence is another component in the EVA migration package. This set of alternative terminal coexistence products includes Vcon, which allows users to connect one or more A series hosts to a V series network; and Acon, which enables V series users with Gemcos or VCS networks to move their V series terminal network intact to an A series network while providing message routing to the V series via Ethernet CPlan.

The third piece of the terminal coexistence series is CP2000/BN, which allows any user attached to a CP2000 network to access applications on any A series or V series host in the network.

Already in use

Although the EVA products and services are still in beta testing and will not become generally available until the first quarter of 1994 — when prices will also be announced — the program has already been used to migrate some early customers, including United Fire & Casualty Co. (UF&C) in Cedar Rapids, Iowa.

UF&C, a V580 and V510 shop that began migrating 650 batch programs and 75 on-line Cobol programs in April 1992, completed the transition to an A16 mainframe in May.

The project, which included the conversion of 27 million LINC database records over the Thanksgiving weekend last year, went smoothly without impacting any of UF&C's end users or custom-

ers, according to Bob Kenward, vice president of MIS at the life insurance company.

"We had never been through a conversion before, but we had heard a lot of war stories," Kenward said. He said he could have "milked out" UF&C's V series machines for another 10 years, "but there are no [research and development] dollars going into the V series machines." Unisys plans to discontinue V series hardware, engineering and manufacturing support at the turn of the century.

Also at the user group meeting, some users voiced their extreme displeasure over what they see as some pricing imbalances by the vendor. V300 users, for example, have seen their software licensing fees rise by 30% during the past two years despite a lack of enhancements to the operating system.

In contrast, users of V400 and V500 mainframes — which use the same operating system as the V300 — have experienced 5% software price hikes, annually. V300 sites make up more than 50% of the V series installed base, Unisys said.

Unisys' response was blunt. "You have to accept that software prices are going up while hardware prices are doing down," Deneen said.

Changeover

About 46 of Unisys' 1,000 V series customers have already migrated to the A series, the company said. Another 75% to 80% of the remaining users are "prime candidates," said Dennis M. Murphy, a Unisys V series program manager.

ware and services to aid the transition to an A series platform.

EVA/Workbench is a PC-based migration tool kit that provides users with a step-by-step migration guide, including an inventory analysis of applications, management of files transferred to the A series and on-line transaction testing between both environments, according to

OpenMapper for Windows

Unisys is readying an Oct. 29 release of a port of OpenMapper, its application development environment, to Windows.

Ports to Sun's SPARCstations are slated for fourth-quarter delivery.

OpenMapper for Windows combines Mapper application development functionality with Designer Workbench, a Unisys Windows-based graphical user interface. It will be priced at \$695 for a developer's tool kit; end-user copies will cost \$300, according to Jay Chaundhry, vice president of marketing and program management at Unisys' Software Products Group.

Robert A. Kilgore, a systems analyst at the Texas Department of Hu-

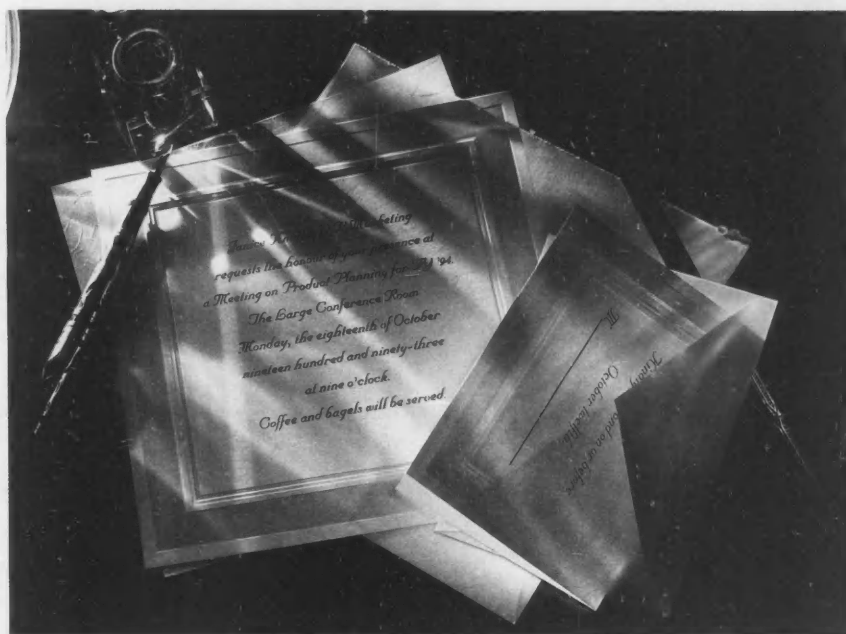
man Services in Austin, who has been beta testing OpenMapper for Windows since June, said he plans to use it to develop executive information systems.

Mapper ports to Sun SPARCstations would be a boon to the California Department of Water Resources in Sacramento. Alan L. Cospier, chief of the unit's dispatch support branch, said he would like to move some of the agency's Unisys 2200 mainframe applications onto SPARCstations.

Unisys also plans next year to deliver Unix versions of Mapper for The Santa Cruz Operation, Hewlett-Packard Co. and Digital Equipment Corp. platforms.

— Thomas Hoffman

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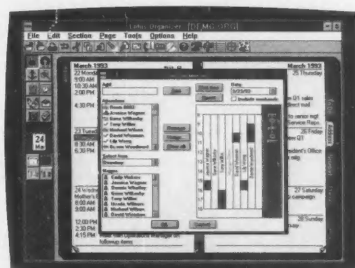


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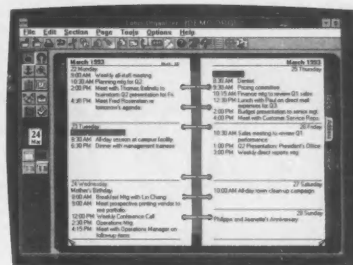


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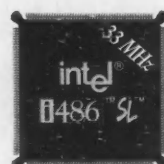
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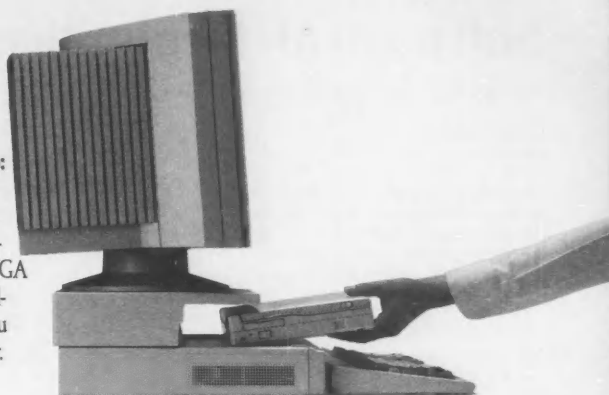




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In Touch with Tomorrow
TOSHIBA

Software AG forms client/server team with NCR, Apple

Marketing and product alliances link desktop and server technologies

By Gary H. Anthes
RESTON, VA.

■ Mainframe software vendor Software AG of North America, Inc. waded deeper into client/server waters recently by disclosing product development and marketing alliances with NCR Corp. and Apple Computer, Inc.

The partnerships are the latest in a series of links forged between companies specializing in mainframe systems, such as Legent Corp. and Amdahl Corp., and

those oriented more toward distributed systems, such as Hewlett-Packard Co. and Sun Microsystems, Inc. [CW, Sept. 27].

The arrangements are intended to bridge legacy and client/server systems and to simplify enterprise-wide computing.

The city of San Antonio developed a 911 emergency dispatching system using Natural and Adabas on a mainframe and then ported it to a client/server environment built around NCR servers and PCs.

For example, he said, if a CPU fails, LifeKeeper must be able to quickly and accurately restore Adabas databases. "I hope the agreement means we could work with either vendor and get it resolved quickly," Stromboe said.

All-around better support

Frank Stromboe, director of information services for the city, said the newly formalized relationship between Software AG and NCR will ensure that new products or product ports will support each other's products and that joint customers will get better support.

For example, he said, if a CPU fails, LifeKeeper must be able to quickly and accurately restore Adabas databases. "I hope the agreement means we could work with either vendor and get it resolved quickly," Stromboe said.

"Both NCR and Software AG are trying to come to grips with the market demand for comprehensive, easy-to-use tools to develop client/server applications with all the robustness that people need to run their business," said Peter Kastner, vice

president of corporate computing at Aberdeen Group in Boston.

Between now and next year, Software AG and Apple agreed to do the following:

- Port Adabas, Natural and middleware products, Entire Net-Work and Entire Broker, to the Unix-based Apple

Workgroup Server 95.

- Interface the Apple/Events messaging protocol with Software AG's Entire Broker Gateway to enable Apple Macintoshes and servers to share data with servers communicating under IBM, Digital Equipment Corp., the Open Software

Foundation and Microsoft Corp. distributed computing protocols.

- Cooperate on future development of Apple's Virtually Integrated Technical Architecture Lifecycle (Vital), a set of development guidelines for distributed systems, and jointly develop middleware tools based on Vital and Software AG's Entire architecture.

Teaming up

Software AG and NCR agreed to do the following:

- Integrate Software AG's Adabas database management system with NCR's Top End on-line transaction processing monitor.

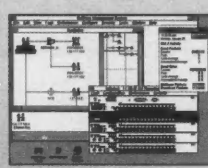
- Integrate NCR's LifeKeeper product, which links redundant computers for fault tolerance, and Adabas.

- Build an interface between NCR's 3270 Agent and Natural that will enable users to use SNA-based 3270 terminals to access both mainframes and NCR Unix servers. The interface will be available in the beginning of 1994.

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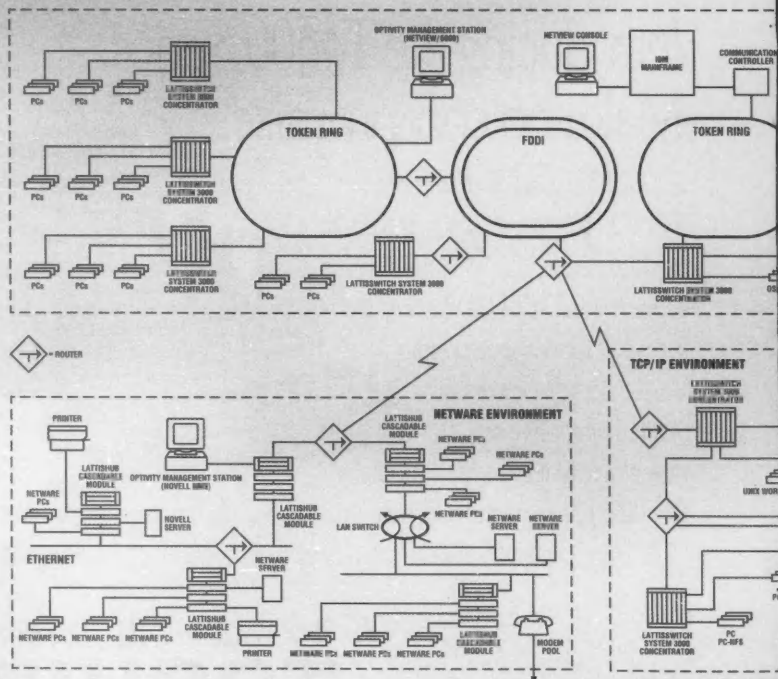
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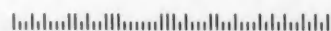
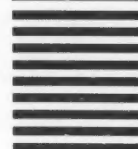
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Large Systems

Sterling Software has announced Gentran:Structure, an add-on mainframe module for the Gentran family of electronic data interchange (EDI) management software.

According to the Dublin, Ohio, company, Gentran:Structure was designed to translate between internal business application formats and a proprietary

or private EDI standard.

Gentran:Structure is priced at approximately \$10,000.

► **Sterling Software**
(614) 793-7000

BRS Software Products has introduced BRS/Search C/S, a product that allows BRS/Search, the company's text retrieval engine, to perform document management applications within client/server architectures.

According to the McLean, Va., company, this release enables BRS/Search to support the customer's choice of standard text, Windows and Macintosh interfaces and a variety of hardware platforms and operating systems.

The client/server software operates on Unix, Digital Equipment Corp.'s VMS and Microsoft Corp.'s Windows NT servers and contains all of the basic search and print functionality of the original host-based product.

Client prices begin at \$1,500, and server prices start at \$250.

► **BRS Software Products**
(703) 442-3870

Tone Software Corp. has announced Release 2.5 of DCC-Compact, a high-performance data compression tool for DB2.

According to the Anaheim, Calif., company, DCC-Compact provides DB2 compression rates averaging 50% to 80%.

Version 2.5 offers an analysis feature that assists DB2 installations in selecting the maximum compression method for each DB2 data structure.

The product fully supports DB2 Version 2.3 and DB2 Version 3.1, and DCC-Compact's Ziv Lempel compression is fully compatible with IBM's Ziv Lempel technique.

The product is CPU licensed and is available for MVS/XA and MVS/ESA.

Pricing ranges from \$19,000 to \$26,500.

► **Tone Software**
(714) 991-9460

Generic Software, Inc. has announced the W-2 Magnetic Media and 1099 Magnetic Media for 1993 reporting.

According to the Madison, Miss.-based company, W-2 and 1099 Magnetic Media instantly give users the ability to magnetically report W-2 and 1099 forms to the government on tape or diskette.

Features for the systems include verification reports; interactive, edited data entry; a multicompany capability; and on-line help text.

The products are available for IBM's AS/400 (native), the System/36 and System/34.

W-2 and 1099 Magnetic Media each cost \$395 per CPU.

► **Generic Software**
(601) 853-1189

Search Software America has introduced SSA-Name3 Version 1.6, a name search software product that allows users to perform a name search of people and company names regardless of variations such as abbreviations and errors in spelling, phonetics and keypunching.

According to the Old Greenwich, Conn., firm, the product is used for databases with 100,000 to 100 million records.

SSA-Name3 is available for Unix, PC-DOS, IBM, Digital Equipment Corp., Unisys Corp. and Tandem Computers, Inc. mainframes.

A perpetual license for SSA-Name3 costs between \$24,000 and \$66,000.

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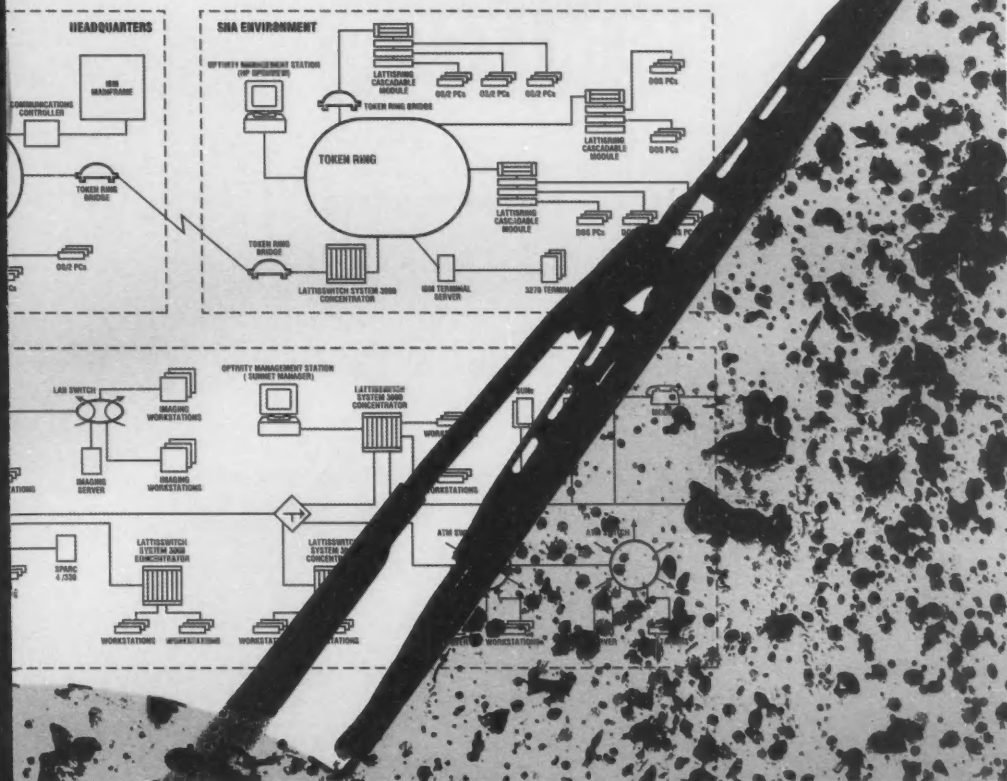
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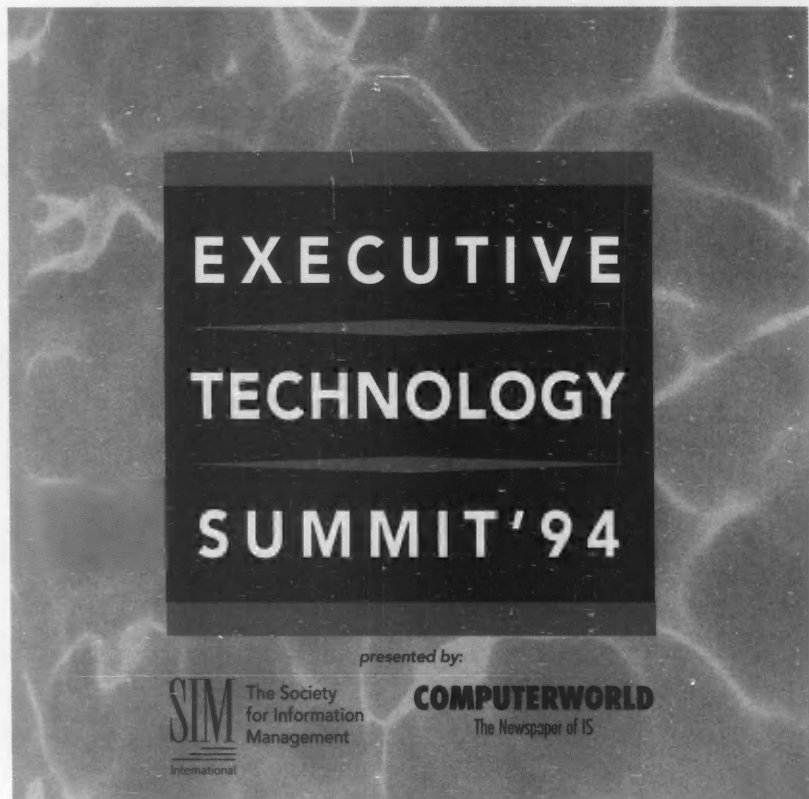
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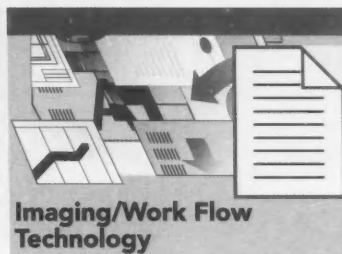
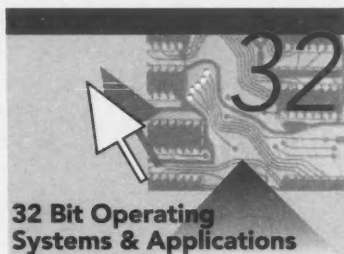
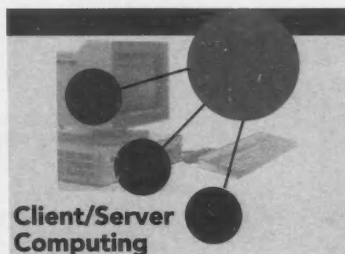
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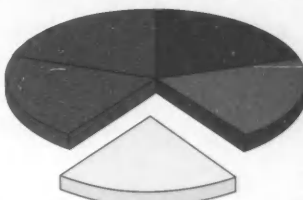
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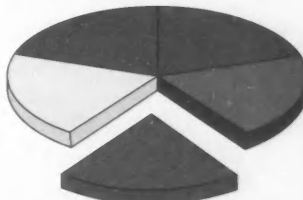
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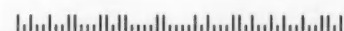
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Application Development

Vendors tackle software version-control beast

By Melinda-Carol Ballou

One of the biggest headaches for developers in client/server environments is managing different versions of software across a range of platforms and development groups.

Realizing this, an increasing number of version-control tools vendors, including Intersolv, Inc., Legent Corp. and Softool Corp., are targeting client/server. Tools vendors such as Powersoft Corp. are linking their products to existing version-control and configuration-management tools.

While version control simply tracks changes to a particular application component over time, configuration management ad-

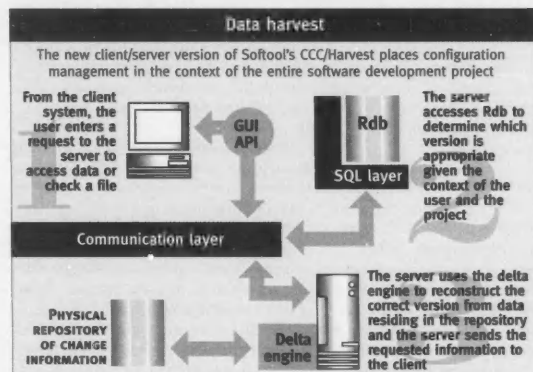
yet addressed configuration management.

Intersolv began shipping a Windows application programming interface (API) earlier this year, facilitating the development of such links. PVCS has garnered the lion's share of the version-control market at about 70%, according to Ed Acly, an analyst at International Data Corp. in Framingham, Mass.

Intersolv officials said more than 30 gateways between PVCS and other development tools currently exist.

However, use of those gateways can offer its own challenges, according to analysts and users.

Versioning and configuration management need to be "built into the product from the ground up in



resses all the components that make up an application. It identifies and controls changes and manages the overall change process. Configuration management is almost like a bill of materials for an application: It is an aggregate of all the functionality contained within an application.

Handling this is vital for developers as they move forward. "We are looking at client/server on a pilot basis, and controlling our [source code] will be important because we'll have a much more complex environment," said Dan Howarth, a manager at Valero Energy Corp., a natural gas company in San Antonio. "We're just at the tip of the iceberg."

Powersoft is addressing version control by linking its PowerBuilder development tool with existing version-control management products, primarily Intersolv's PVCS, although Powersoft has not

order for it to work well, and it has to be under the control of a single vendor," said Rich Finkelstein, president of Performance Computing, a Chicago consulting firm. "The multivendor products are difficult to deal with," he said, because no vendor will take full responsibility when problems arise, and the connections between tools are "often weak."

Waiting game

Powersoft officials said they have waited to implement configuration management for PowerBuilder until other products such as those from Softool and Legent have shipped; these more fully address configuration management. More robust connections will ship with the next point release of PowerBuilder, they said.

For its part, Softool late last month announced CCC/Harvest

Version control, page 100

Whither Win32 woes?

Microsoft addresses confusion over versions of API

By Ed Scannell and Michael Vizard

Trying to extract itself from the tangled web it has spun, Microsoft Corp. is now steering developers toward the full implementation of its 32-bit Windows application programming interface (API).

It will be up to developers, however, to decide what features of that kit they want to integrate in their applications, depending on whether they are writing for Windows 3.1, Chicago or Windows NT.

During the past couple of years Microsoft has talked fervently to developers about writing their applications to take advantage of subsets of its Win32 API, which will allow applications to run on various Windows platforms.

Coping with confusion

This new strategy is intended to resolve the confusion brought on by Microsoft's initial decision to promote three variations of the Win32 kit.

This situation has confused developers, who thought the extra two versions — Win32s and Win32c — were separate and significant alternatives to Win32. Many believed they had to place bets on which one would drive the volume platform for Windows.

But as the company began outlining Cairo and Chicago, its future operating system development strategies for Windows NT, the company found it more prudent to emphasize a single kit.

Microsoft officials, who admit they did not clearly articulate their message, now say developers should focus primarily on the Win32 API. If developers wish to optimize an application for a particular platform, they can focus on supporting only specific elements.

The name game

The confusion stems from developers' using the term Win32s to describe a subset of the kit that allows applications to run on Windows 3.1 and NT, and a second subset, referred to as Win32c, that optimizes Win32 applications for Intel Corp. platforms.

"We screwed up. We got ourselves caught up in our shorts trying to be a little too accurate in our positioning," said Jonathan Lazarus, vice president of Microsoft's systems strategy.

"Users always ask me about Win32c and Win32s, and even though I have the products to develop those sorts of apps, it all beats the hell out of me. I am very unclear about it," said Mike Drips, a beta user of multiple versions of Windows in Tampa, Fla.

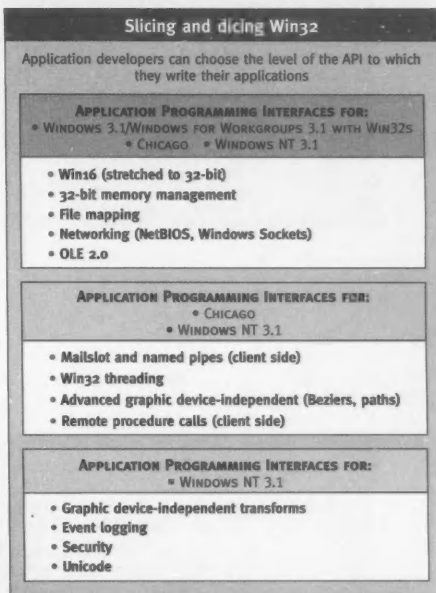
According to Microsoft officials, the confusion was unintentional.

What the industry has known as Win32s and

Win32c "are not that much different than Win32. They are merely subsets of Win32," said Doug Henrich, Microsoft's director of developer relations.

Henrich and other Microsoft officials now say developers writing applications to the several existing and future Microsoft operating system products need concentrate only on Win32.

Simply put, Win32s represents Microsoft's



attempt to take all the 16-bit APIs in Windows 3.1 and allow developers to do 32-bit implementations of them. "Developers just take their 16-bit Windows source code, do a small amount of work up front, and from there it is a straight recompile," Henrich said.

The Win32c set of APIs, for the most part, is an extension of the Win32s APIs, but it specifically supports features in Chicago.

"The business of Win32c was sort of silly on our part. It is just a subset of APIs that will be natively supported in Chicago, not something that was to be an alternative to Win32," Henrich said.

Developers should think of these variations as an evolution of the Win32 API that they can use or not, depending on their development goals. The currently available Win32 software developer's kit will basically be the only one Microsoft makes available. There will not be a different one for Win32, Win32s and Win32c.

"This seems to have been a confusing issue for customers and the press, but not developers," he said. "We should have realized before that customers aren't the ones interested in APIs."

"HE'S IN A
MEETING."

"SHE ONLY DROVE
IT TO CHURCH ON
SUNDAYS."

Application Development

Oracle, Sybase map out multimedia maneuvers

By Kim S. Nash

Oracle Corp. and Sybase, Inc. have laid tracks for nearly polar-opposite multimedia development tool strategies. While Sybase guns for a piece of the highly competitive Windows desktop realm, Oracle envisions a digital information highway where cable and telephone companies use Oracle tools to build interactive consumer applications such as home shopping.

Each plan has merits. But the tools are unlikely to roar into typical information systems shops any time soon, observers said, because multimedia remains a fringe technology.

"Sure, pretty pictures and sound could make some applications better, but do traditional business systems really need such functions?" asked Robert Gentry, vice president at Database Server Systems, Inc., a consulting firm in San Francisco.

"We don't see much call for multimedia in traditional business applications right now," Gentry said. "Maybe it'll happen down the road."

His company helps users move applications from mainframes to Unix-based platforms running relational databases. Most of its business, he said, comprise Sybase and Oracle users.

Aiming high

Oracle's main thrust in multimedia is not the average IS department but cable, content and phone companies, such as partner US West. IS shops will benefit when the technology trickles down to Oracle's bread-and-butter database products, according to Tim Negrin, Oracle's senior director for server product marketing and corporate strategy.

The Redwood Shores, Calif., company is expected to ship in January Oracle Media Objects, an object-oriented tool set for building interactive TV systems

such as home shopping, personalized newspapers and movies-on-demand [CW, Sept. 27]. The applications would run on massively parallel processors, such as those from NCube, Inc., Thinking Machines Corp. and others. Couch potatoes would access them via set-top boxes that combine television and PC features.

Sybase, meanwhile, is seeking to pump up its presence in the application development tools area by tying together recently acquired products with internally built offerings [CW, Aug. 16]. PCs equipped with Windows are the platforms Sybase has in mind for its Momentum product family.

Because Sybase has been historically weak in the tools arena, Sybase's SQL Server database users have had to buy development aids from Sybase-sanctioned third parties such as Powersoft Corp. Sybase's products are due to start shipping in mid-1994.

However, for Sybase's multimedia vision to become reality, the Emeryville, Cal. firm must unite disjointed products, analysts said. Gain Momentum, a tool inherited with its acquisition of Gain Technology, Inc. last year, is based on an object-oriented database from Objectivity, Inc.

Sybase recently introduced additional Momentum tools to work with Gain, but they are based on Sybase's SQL Server relational database.

SQL Server can support limited object functions, but a gulf exists between the two databases, according to Sanjeev Varma, an analyst at New Science Associates, Inc. in Westport, Conn.

"Before IS can think about using [Momentum products], Sybase has to figure out how to get the two databases to converge," Varma said.

According to Sybase officials, the disparity between the two products is an issue they plan to address next year.



Microsoft to offer class libraries for OLE

By Melinda-Carol Ballou

Microsoft Corp.'s plans to provide class libraries for its Object Linking and Embedding (OLE) environment are expected to make it easier for developers to create OLE 2.0 Windows applications.

Microsoft will make available by year's end its Microsoft Foundation Classes (MFC) for OLE. Roger Heinen, senior vice president of development tools, described MFC as a set of templates that developers can tailor to build specific Windows applications. This will allow developers to use ready-to-go templates for OLE 2.0 instead of having to learn the more arcane OLE specification.

Most likely, MFC support of OLE 2.0 will

be formally announced at the Professional Developer's Conference in San Jose, Calif., during the first week of December, company sources said.

Developers agreed that linking OLE with MFC will make creating applications easier. For Roger Spitzig, a senior systems engineer at The Mutual Life Assurance Company of Canada, offering OLE support with his site's application proved to be too much effort.

"We had a deadline for getting our system out, and the complexity of OLE... caused it to be a larger job than we had time for," Spitzig explained.

"Class support from MFC will help to wrap the intricate details and get up to speed more quickly," he said.

Intersolv opens Gateway

Version-control giant expands Polytron system

By Melinda-Carol Ballou

Intersolv, Inc. bolstered the company's Polytron Version Control System (PVCS) last week with support for a greater range of operating systems, workbenches and better version control for LAN-based developers.

PVCS Production Gateway 2.0 for IBM's MVS, OS/2 and Windows makes it easier for developers in LAN-based environments to synchronize their files with major IBM mainframe library systems, company officials said.

This link is built on IBM's Advanced Program-to-Program Communications protocol and provides communications transparency and security for host-to-LAN or LAN-to-LAN networking, the company said.

Intersolv is also offering interfaces between Microsoft Corp.'s Visual C++ and Symantec Corp.'s C++ development environments. The link to the Microsoft tools will allow Visual C++ users to access PVCS commands and on-line help from the Microsoft Visual Workbench.

Developers will be able to record each successive revision of a work file, use multiple locks to prevent multiple users from updating a file simultaneously, easily revert to previous revisions of a work file and assign labels to revisions associated with a particular version of a project. The Visual C++ interface is shipping now as part of the PVCS Version Manager.

Intersolv established a joint marketing and development agreement with Symantec to provide the interface between PVCS and Symantec's C++. The agreement lets Symantec embed PVCS Version Manager Dynamic Link Libraries in its C++.

Additionally, Intersolv announced a PVCS interface to the Open Software Foundation's Motif and Hewlett-Packard Co.'s Open Look and to Repository Technologies, Inc.'s (RTI) Control First System (CFS) for problem tracking and release management. CFS offers a central repository for enhancement and problem information.

While some analysts voiced caution about multi-vendor product links (see story page 97), one PVCS user said he looks forward to evaluating the interfaces between Visual C++ and Symantec tools and the increased configuration-management capabilities of PVCS.

"This will make it easier to work with those tools and use version control — we'll be looking into those soon," said Mike Hall, a software engineer at National Instruments Corp., an instrument control and scientific data acquisition company in Austin, Texas. "We initially just used version control but increasingly we need configuration management because our projects have grown so much."

The link to Symantec's C++ tools is priced at \$499 per copy; the interface to CFS is priced at \$99 and is available from RTI.

Intersolv owns the vast majority of the version-control market, with around 70%, according to analysts.

Briefs

HP adds library to SoftBench

Hewlett-Packard Co. announced that it will embed Ilog, Inc.'s library of reusable objects and behaviors into future versions of SoftBench, HP's computer-aided software engineering tool set and integration framework.

Aurum, Verity team up

Aurum Software, Inc. and Verity, Inc. announced a joint sales and marketing partnership to offer Aurum Software's Customer Resource Planning system and Verity's Topic document-retrieval system to automate customer support and help desk applications.

Deal for ADW/MVS users

Attention KnowledgeWare, Inc.'s Application Development Workbench (ADW)/MVS repository customers: Manager Software Products, Inc. in Lexington, Mass., has a deal for you. Manager Software Products is offer-

ing a dollar-for-dollar credit for the full ADW/MVS purchase price if its users exchange their current systems for Manager Software Products' Method Manager repository and dictionary product. The trade-in offer will be valid until March 31, 1994, according to company officials.

Cross develops access

Cross Access Corp. will implement IBM's Distributed Relational Database Architecture — a set of protocols defined by IBM for access to relational and nonrelational databases — in the Cross Access Data Delivery System, a middleware product that provides seamless open access to enterprise-wide data.

Klee joins Transaction

Transaction Solutions, Inc. has appointed Shel Klee as president. Previously, Klee was senior vice president at Home Savings of America, one of the largest savings and loan institutions in the U.S., where he was responsible for all software systems development and implementation.

"I READ IT FOR THE ARTICLES."

"IT CAN BUILD ANY MISSION-CRITICAL, CLIENT/SERVER APPLICATION."

Visix releases new version of Galaxy

By Melinda-Carol Ballou

Visix Software, Inc. announced a new release of the company's Galaxy Application Environment, which sets up consistent development capabilities across a wide range of operating systems.

At the same time, Visix announced a C++ version of Galaxy.

Galaxy is a cross-platform development environment for creating large-scale applications that are graphical and that can be distributed across a range of platforms. The new version works under Unix, Macintosh, Windows, Windows NT, OS/2 and OpenVMS platforms, company officials said.

Using Galaxy, applications are created once, and then are compiled to run on the range of Visix-supported platforms, windowing systems and networks.

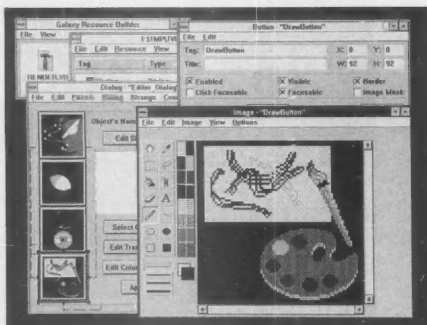
To create portable applications, Galaxy abstracts the system services required by a specific platform. Developers write to a uniform, multiplatform application program-ming interface (API).

Galaxy also offers a superset of the capabilities of native tool kits, including those for Macintosh Toolbox, Windows SDK, Motif and Open Look, so developers do not have to manually port applications to multiple tool kits.

"Visix has done a credible job—

it's the best thing of its type on the market," said Rikki Kirzner, an analyst at Dataquest, Inc., a San Jose, Calif., consulting firm. "They offer portability at the application level across a broad range of platforms."

A number of development groups at J. P. Morgan & Co., a financial services company in New



Galaxy 2.0 features an improved Visual Resource Builder, making it easier to construct the user interface portion

York, are using Galaxy to build trading systems, according to Steve Kavanaugh, an associate there. Galaxy lets him move applications from Sun Microsystems, Inc. platforms to Apple Computer, Inc.'s Macintosh.

"In some instances, the applications need to be running on both Sun workstations and Macintoshes and [Galaxy] gives us the ability to do that," Kavanaugh said. The new release offers a number of new features and enhancements. These include the following:

- The uniform multiplatform API.

- A runtime system that will allow developers to construct networked applications.

- Three new managers — Combo Box, Spinner and Drag—for developing drag-and-drop applications.
- Support for the Windows Multiple Document Interface.

- An improved Visual Resource Builder, a Galaxy tool that makes it easier to construct the user interface portion of an application.

C++ Version

Some users were looking forward to the C++ version of Galaxy. According to Brian Salzman, a senior programmer at Murphy and Durieu, a New York brokerage house, the C++ version will lead to cleaner programming.

In C, Salzman said, "you have to make sure that you reference the pointers correctly when you go through the classes. But in C++, if you've inherited those functions from a parent class, you don't have to worry about it," he said.

Galaxy 2.0 will ship by December for Unix, Macintosh System 7.0, Windows 3.1, Windows NT, OS/2 Version 2.1 and Open VMS.

The prices for the C version range from \$7,800 to \$9,600 per developer seat, depending on platform. Galaxy/C++ is priced at \$12,100 per developer seat on all platforms.

Tools

CASE offering strengthened

By Melinda-Carol Ballou

Popkin Software & Systems, Inc. last week released a new version of its System Architect (SA) computer-aided software engineering (CASE) tool, which features improved support for developers creating client/server applications, company officials said.

Popkin is also shipping links between SA and Powersoft Corp.'s PowerBuilder.

Included with SA Version 3.0 are new network security features that enable project leaders to identify and classify personnel with appropriate levels of authorization. Also included are access control functions, enhanced data modeling, improved graphical user interface and real-time modeling and a new browser.

The access control functions allow members of a project team to check in, check out or freeze repository objects or groups of objects. This gives project leaders control over system development and allows team members to access and protect the data that they are working on more easily. "The access control will be useful," said Andrew Renouf, senior information systems analyst at Ontario Hydro Corp., a utility in Toronto.

Enhanced data modeling with Version 3.0 includes broader support of the database administration function through database management system-specific models, support for logical views and the identification of relationship lines between two connected entities, officials said.

The new SA Browser allows users to search their databases to locate diagrams and provide model representations. Users can search through databases for various kinds of definitions and then determine where a dictionary item or data element might be used.

System Architect 3.0 will ship in December. A single-user version for the Windows environment is priced at \$1,395, and the first two copies of the network version cost \$2,940. The OS/2 PM version is priced at \$1,795 for the single-user version and \$3,750 for the first two copies.

Options to System Architect Version 3.0 include a screen painter, priced at \$496; a schema generator, priced at \$795; reverse data engineer, priced at \$795; and a documentation facility, priced at \$1,395.

Version control

CONTINUED FROM PAGE 97

that seeks to address configuration management and version control in client/server environments. CCC/Harvest supports various phases of the application life cycle, including turnover and migration management and impact analysis, company officials said.

Project level information and configuration management reside in a relational database management system with CCC/Harvest, and version-control data is located in a repository of change information.

CCC/Harvest will work with databases from Oracle Corp., Sybase, Inc. and Informix Corp. by next June, the company said.

Softool users said they are interested in checking out the new product.

"We need to work out interfaces with a lab which is 10 miles away from us, and we're hoping Harvest may make that easier for us," said Dorothy Huffman, information systems manager at the Jet Propulsion Lab in Pasadena, Calif., a NASA research and development facility.

Softool is not alone. To name two others, Legent is expected to announce by mid-1994 client/server versions and API for its Endeavor product. And Intersolv will beef up its application development system tools later this year.

According to Acly, the Intersolv announcement indicates that there is a "very hot marketplace for configuration management right now. PVCS has been on a roll for six to eight months."

In the client/server environment, however, it is not always easy to keep both the client and server versions of the products in sync.

Some analysts suggested that users be careful in their selection. The technology is, for the most part, new and not fully proven for distributing configuration management across large, corporate, client/server environments, they said.

"A next generation of software will recognize these problems and come up with a more integrated design from the ground up," Finkelstein said.

Micro Focus, Inc. has announced Version 1.0 of Remote IMS, a product that allows the development, testing and execution of IMS applications on the workstation with access to IMS/ESA databases located on the mainframe.

Remote IMS is able to test large and complex IMS databases by creating distributed IMS systems, copying databases and testing logical relationships, according to the Palo Alto, Calif., firm.

Remote IMS comprises the mainframe Remote IMS Server and the workstation Remote IMS Requester.

The Remote IMS Server for IMS/ESA costs \$15,000 per logical CPU. Each workstation requester costs \$300.

► Micro Focus
(415) 856-4161

Powersoft Corp. and Ernst & Young have announced an interface between Powersoft's PowerBuilder, a client/server development tool, and KnowledgeWare, Inc.'s Application Development

Workbench (ADW), a computer-aided software engineering tool.

According to the Burlington, Mass., company, the PowerBuilder/ADW interface will allow users to automatically transition requirements defined in ADW to PowerBuilder.

The interface was designed to improve the productivity of the developer with an on-line, automated interface, as well as preserve and extend the investment of training methods, tools and existing business models.

Features include inheritance to simplify and automate the generation of an application and DataWindows and Windows. Extended attribute tables — information types (domain definitions) defined in the ADW analysis model are employed to generate validation rules and edit styles in the PowerBuilder extended attribute tables.

The PowerBuilder/ADW interface costs \$4,000 per developer and is available as a tool option in the Ernst & Young Navigator System Series.

► Powersoft
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TUNE IN, TURN ON, GET RICH?

IS executives are building and looking to exploit the techno-infrastructure for future interactive TV services

By Mitch Betts

Firms are betting literally billions of dollars that there is a profitable future in interactive TV. The dream is that America's couch potatoes will be able to surf along 500 TV channels, play video games with people across the country, select almost any movie at any time of day and pay

their bills with a few clicks on the remote control.

To make it happen, information systems executives and chief technology officers are talking big-time strategy with the top corporate executives who are cutting deals with Hollywood, telecommunications, computer and cable TV companies on an almost daily basis.

"This has top-level attention, more than I've ever seen for an IS project before," says Roy Prater, vice president of MIS at Cox Enterprises, Inc. in Atlanta. Prater is in charge of upgrading the cable TV operator's wide-area network to become an information highway populated with video servers for interactive TV.

The much-hyped convergence of digital media is also prompting IS executives in other industries, such as banking, retailing, direct marketing and health care, to consider using the interactive TV services as a new channel for reaching U.S. consumers.

At your fingertips

Avon Products, Inc., for example, is eager to get two-way voice and video communications services from the new multimedia alliances. Bob Hughes, manager of telecommunications at Avon in Rye, N.Y., says interactive TV services would allow headquarters to send out video clips of information on new products to Avon's army of door-to-door sales representatives and their customers.

Hughes imagines a video clip that could demonstrate how to put on a particular facial makeup product and then accept questions about the product. But he really gets excited about the prospect of allowing customers to punch a few buttons to order the Avon product after the demo.

The megadeal that triggered this sort of thinking was the \$5 bil-

lion alliance of US West and Time Warner, Inc. to create interactive TV services nationwide by 1998. US West brings to this high-stakes party its expertise in network switching, billing and transaction processing; Time Warner brings its cable TV stations and the entertainment resources of Warner Bros., Inc. and Home Box Office.

That deal, followed by the proposed merger of Bell Atlantic Corp. and Tele-Communications, Inc. (TCI), got the attention of chief information officers such as Martin Joyce Jr., executive vice president for client services at Blue Cross/Blue Shield of Massachusetts in Boston.

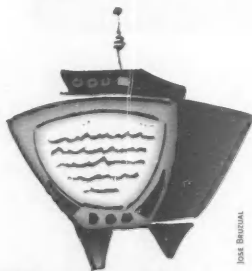
Joyce says the insurer could exploit the interactive TV channels to deliver medical advice (such as information about drug interactions and side effects) and marketing programs that enhance the company's public image. Customers might also be able to call up their medical history, review their claims payment records and even schedule their next visit to the health clinic, he says.

"We haven't spent any money on it yet," Joyce says, "but [interactive TV] has now entered into our strategic thinking about consumer marketing and services in the next five years."

Some hard-core data processing professionals might scoff at the notion of embracing TV, but Joyce says it is time to take the old IS blinders off.

"We have to be realistic. Home PC-based services failed to get much penetration, but cable TV has the penetration [in consumer homes]. We would be foolish not to take advantage of that."

For the CIOs working within the mass media industries, this is a heady time indeed, and their star is rising out of the back office. At New York-based Viacom International, Inc., which owns the MTV,



Alliance mania

A sampling of the many alliances (including joint ventures, investments and suppliers) announced for interactive TV

Time Warner, Inc.

PROGRAM CONTENT
Spiegel, Inc.
Sega of America, Inc.
CUC International, Inc.

TECHNOLOGY
US West, Inc.
Toshiba Corp.
Silicon Graphics, Inc.
Scientific-Atlanta, Inc.

Viacom International, Inc.

PROGRAM CONTENT
Blockbuster
Entertainment Corp.
Paramount
Communications, Inc.*
CUC International, Inc.

TECHNOLOGY
Nymex Corp.
AT&T
*Viacom is trying to merge with Paramount, but QVC (affiliated with Liberty and Tele-Communications, Inc.) is also bidding for it.

Tele-Communications, Inc.

PROGRAM CONTENT
Liberty Media, Inc.
Turner Broadcasting Co.
Bertelsmann AG
Sega of America, Inc.

TECHNOLOGY
General Instrument Corp.
AT&T
Zenith Electronics Corp.

Interactive Network, Inc.

INVESTORS
National
Broadcasting Co., Inc.
Bell Atlantic Corp./
Tele-Communications, Inc.
Gannett Co., Inc.
Cablevision Systems Corp.
A.C. Nielsen



► Eon Corp.'s Bob Chiaramonte: 'In a new industry such as ours, every problem that comes up has never been faced before'

Nickelodeon and Showtime networks, CIO Henry J. Leingang was recently promoted to senior vice president in recognition of the growing strategic importance of information technology [CW, Aug. 16].

Similarly, Turner Broadcasting Co. in Atlanta recently created its first CIO position for the sole purpose of forging an IS infrastructure for the fast-growing multimedia business.

Elahe Hessamfar, who came to Turner from the telecommunications industry, says interactive TV is nothing more than a huge, distributed database of

movies, news and information that allows consumer interaction. "Tomorrow, information systems will become your business," she says. "Unless you realize that, you will not be positioned for the new world."

Hard to handle

One thing is for sure: All of that consumer interacting will require some heavy-duty transaction processing systems to handle the ordering, delivering and billing chores for complex services such as on-demand videos, home banking and home shopping.

Denver-based TCI, the nation's largest cable TV conglomerate, has already started overhauling its transaction-processing systems to prepare for the rollout of 500 channels. One of its first steps was to create a centralized command-and-control center capable of processing 180 pay-per-view transactions per second [CW, April 12].

But that is just a start. Sadie Decker, TCI's corporate vice president for advanced information technology, says the astronomical number of variables in interactive TV — somewhat like the

Tune in, page 104



WILL IT FLOP?

Interactive TV gambles that the public will pay more for their entertainment

The \$30 billion question is whether interactive TV will be the big flop that videotext was in the 1970s and 1980s.

After all, the same consumers who were outraged by \$20 cable TV bills may not pay \$60 to \$70 a month for the new wave of interactive TV services.

The optimistic view is held by Bill Battino, a consultant at Coopers & Lybrand in New York. The time is right for interactive TV, he says, because it is focused on the kinds of video entertainment services that Americans seem to crave — i.e., on-demand movies rather than text rolling across a screen.

Interactive TV ventures, in essence, are trying to take some market share away from existing consumer behaviors, such as running out to the video rental store. "The previous failures tried to build new forms of consumer behavior, instead of evolving consumer behavior," Battino says. "Our research shows that consumers are interested in interactivity and control."

Similarly, Gene DeRose, market research director at Jupiter Communications Co. in New York, says the large investments, the high market penetration of cable TV and the focus on entertainment are all good signs for the interactive TV world.

The more worrisome view is held by Steven Sieck, vice president in charge of electronic services research at Link Resources Corp. in New York.

"So much is pure hype at this point," Sieck maintains. Even Time Warner's 1994 interactive TV trial in Orlando, Fla., will not be able to deliver full-motion video applications, he says. "They're talking to programming providers about still-frame applications."

Having witnessed the first-generation videotext experience in the U.S. and now seeing the megahype surrounding interactive TV, Sieck says he is "very frightened that there's going to be a huge gap between the expectations that are being created and what the interactive TV industry is going to be able to deliver in the next five years."

— Mitch Betts

Eon Corp. (formerly TV Answer, Inc.)

PROGRAM CONTENT
Capital Cities/ABC, Inc.
Public Broadcasting System
Encyclopaedia Britannica
Meridian Bancorp, Inc.
Intuit, Inc.
Domino's Pizza, Inc.
JC Penney Co.

TECHNOLOGY
Hewlett-Packard Co.

DigiCable

PROGRAM CONTENT
Prodigy Services Co.
TECHNOLOGY
General Instrument Corp.
Intel Corp.
Microsoft Corp.

Digital TV converter boxes

TECHNOLOGY
Motorola, Inc.
Scientific Atlanta, Inc.
Kinetics Labs, Inc.

First Cities Project

Microelectronics & Computer Technology Corp.
Apple Computer, Inc.
Tandem Computers, Inc.
US West, Inc.
Kaleida Labs, Inc.
North American Philips
Bellcore
Southwestern Bell Corp.

Tune in

CONTINUED FROM PAGE 103

complexity of the Star Wars anti-missile program — will require a total rethinking of the concept of billing.

"Billions of transactions will cost billions of dollars to monitor, and that cuts into profit, and that's not smart," Decker says. Instead, she hints that it might be wise to come up with simplified pricing schemes and bill electronically, perhaps using the interactive TV service itself.

IS professionals say the new world of interactive TV requires some new skills in technologies such as real-time transaction processing, video servers, multimedia databases, network switching and digital video compression, as well as an understanding of the entertainment business and sophisticated marketing.

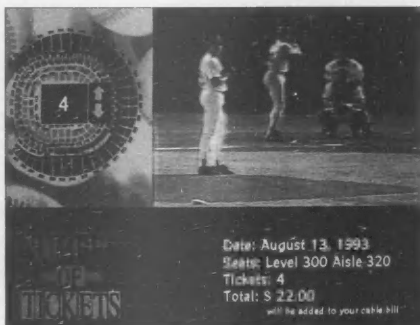
In other words, this is not plain-vanilla data processing, such as general ledgers and accounts receivable. For example, technologists on this frontier are addressing issues such as how seven customers who want to watch *Rocky V* at slightly different but overlapping times can do that.

Because of the cutting-edge nature of the business, Eon Corp., a Reston, Va., start-up firm that will roll out its wireless interactive TV service in mid-1994, has had the best luck hiring technical employees from academic fields that focus on creative problem-solving.

"In a new industry such as ours, every problem that comes up has never been faced before," says Bob Chiaramonte, vice president

for IS and product engineering at the firm, formerly known as TV Answer, Inc.

Chiaramonte, who has already tackled many of the issues facing the newcomers, developed a hub-and-spoke architecture. "The consumer interacts with our service, such as ordering merchandise from a catalog or getting news on what's happening in Bosnia, and then we need to route that infor-



Interactive TV will allow viewers to buy sporting game tickets through their TVs

mation to our providers," he explains.

A big question at the moment is how much of the IS work for the new interactive TV services will be done in-house and how much will be done by outsourcing vendors. Experts say the cable TV industry now outsources most of its billing functions to firms such as the CableData division of U.S. Computer Services in Rancho Cordova, Calif., and First Data Resources, Inc. in Omaha.

New mind-set

Senior executives are beginning to realize that the world of on-demand video and banking will require them to rethink their traditional IS strategy, says Bill Battino, a partner at the mass media consulting practice of Coopers & Lybrand in New York.

"Now they're assessing whether those [outsourcing] vendors can continue to provide the kind of support they'll need in the future and whether their own internal management information systems need to become more sophisticated to handle the more complex environment that is developing," Battino says.

Will sophisticated IS be a make-or-break factor in the life of interactive TV? Not really, according to Battino. Marketing and killer applications — hit forms of entertainment — will be the critical success factors.

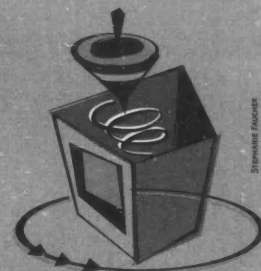
But someone has to make the Hollywood visions of on-demand entertainment work in real life by delivering high-quality video, data and sound and accurate ordering and billing. Consumers will not be happy if their spiffy new TV system switches their movie request with another

customer's or botches the monthly billing statement.

Steven Sieck, vice president for electronic services research at Link Resources Corp. in New York, says most media companies, in their rush to sign big-bucks alliances and shape the perceptions of Wall Street, have failed to consider tactical issues such as administrative systems.

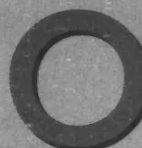
"Transactional billing systems and other administrative capabilities are virtually absent from the infrastructure for interactive TV now, so the involvement of technologists who can provide those — particularly for the cable TV industry, which is woefully lacking that infrastructure today — will be critical," he says.

Betts is *Computerworld's* national correspondent, based in Washington.



WHO'S WATCHING WHOM?

NBC plans to track viewers for marketing database



ne powerful feature of interactive TV is that databases can be kept on consumer transactions, and that data can be used for targeted marketing campaigns.

Even in today's analog TV world, that capability has not gone unnoticed. The NBC TV network, a New York unit of General Electric Co., will soon

launch a program called "NBC Viewer Service," in which an announcer will invite viewers to dial a toll-free number to receive more information (such as catalogs or coupons) about products shown during a commercial break.

The initiative allows NBC to provide advertisers with "qualified leads," while NBC keeps a database of the callers and sends them quarterly program guides with advertising. "The database that we assemble will be very valuable to us and our advertisers," says Alan Cohen, senior vice president of marketing.

However, providers risk a consumer backlash if they carelessly sell the data to third parties or use the information in ways that consumers view as an invasion of privacy.

At least one interactive TV provider, Eon Corp. in Reston, Va., is already promising to keep its transactional data, such as consumer buying patterns, confidential. "We want consumers to know that [privacy] is part of our culture, that we won't be selling that information," says Bob Chiaramonte, vice president for IS and product engineering.

— Mitch Betts

INTERACTIVE PIONEER

Meridian Bancorp takes the lead in home banking services

Meridian Bancorp, Inc. may not have the name recognition of, say, Citibank NA, but this bank holding company in Reading, Pa., is a true pioneer in allowing customers to perform services such as account inquiries, funds transfers and bill payments directly through their TVs.

Meridian already offers home banking on the Prodigy network, but last year it became the first bank to strike up an alliance with Eon Corp.'s interactive TV service.

"We see interactive TV as attractive because it has

such a large market," says Joseph S. Pendleton III, senior vice president of electronic banking at Meridian. However, he acknowledges that the functionality will be limited somewhat, at least initially.

But Pendleton seems undaunted. "Our philosophy is that whatever kind of device the customer wants to use, that's what I want to support," he says. "I don't sell PCs, phones or TVs; what I sell is access and payment services to customers."

Consequently, the job of the IS subsidiary at Meridian has been to build a "back-room engine" that links all of the various banking systems, such as checking accounts and savings accounts, so consumers can transfer funds and pay bills. Just as important, the mainframe engine also has the interfaces for accepting incoming transaction requests from Prodigy and Eon.

With this front-end processor as a go-between, Pen-

leton says, "The checking account system doesn't know whether the transaction came from a TV set, telephone or PC, and it doesn't really care. The transaction is the same."

Pendleton says he can afford to be experimental, even if a particular home-based gizmo never pans out. When a new customer device comes along, "I'm looking at the cost of developing the interface between ourselves and the new channel," he says.

"That's not cheap, but it's not so expensive that we can't take some risks."

The actual IS work is done by Meridian's automation subsidiary, headed by Bruce L. Ressler. Pendleton says he works very closely with James J. Vaiana, vice president of the electronic banking systems group, who has an IS title that may become more common in the banking industry if home banking ever takes off.

— Mitch Betts

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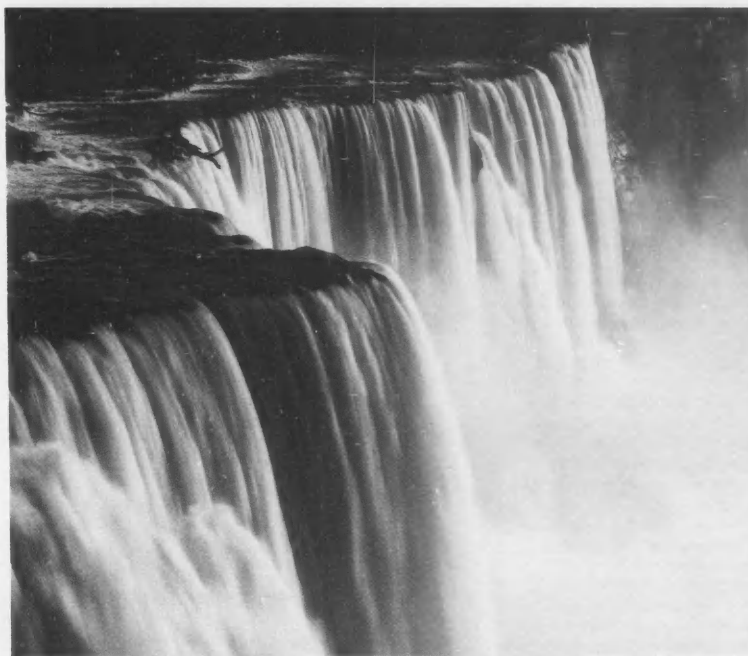
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Professional Travel Corp. in Denver has announced the appointment of **Bob Griffith**, certified public accountant (CPA), to the newly created position of vice president, finance and administration. He will be responsible for overseeing the accounting, MIS, human resources and administrative departments, as well as the company's benefits program.

Prior to joining Professional Travel, he served as the corporation's outside business consultant and CPA.

U.S. Commerce Secretary Ronald H. Brown recently announced the **1993 National Medal of Technology** winners, who were commended for their contributions to society.

Among the nine winners were **Kenneth H. Olsen**, founder of **Digital Equipment Corp.** in Maynard, Mass., who received a product and process innovation award "for his contributions to the development and use of computer technology and for his entrepreneurial contribution to American business."

Walter L. Robb of the **General Electric Research and Development Center** in Schenectady, N.Y., was honored for his work in advanced manufacturing technology. Robb was cited "for his leadership in the development and commercialization of new medical imaging technologies and related manufacturing initiatives, both of which have improved people's health and contributed to U.S. global leadership in a high-technology industry."

Amos E. Joel Jr. of **AT&T Bell Laboratories** in Murray Hill, N.J., was awarded the Medal of Technology for his work in product and process innovation. He was cited "for his vision, inventiveness and perseverance in introducing technological advances in telecommunications, particularly switching, that have had a major impact on the evolution of the telecommunications industry in the U.S. and worldwide."

The National Medal of Technology is considered the highest award bestowed by the president of the United States for extraordinary achievements in the commercialization of technology or in the development of human resources that foster technology commercialization. Since the first awards were given in 1985, 84 individuals and three companies have received the National Medal of Technology.

Mark Gross has been appointed national director of **KPMG Peat Marwick's** Health Care Information Technology practice in Chicago. The announcement was made by John Gannon, KPMG Peat Marwick's managing partner.

Prior to joining KPMG Peat Marwick, Gross worked at SMS Corp., where he served as vice president of marketing for

two years. He was previously the national director of health care information technology at Ernst & Young.

Patricia R. Malloy has been promoted to director, information services, at **Sisters of the Sorrowful Mother** in Milwaukee, the parent company of seven Midwestern hospitals.

Prem Mehra has joined **Andersen Consulting** in Chicago as an associate part-

ner. Mehra had been with IBM since 1970, as a spokesman for the database management system DB2.

Etienne Droulez has joined **The Clotheshline, Inc.** in Anaheim, Calif., as director of management information systems. Droulez will be responsible for information systems, including application development, computer operations, in-store systems, micro-applications and voice and data communications.

Nolan, Norton & Co. has appointed **Charles A. Raz** as director of its New York office.

In his new position, Raz will work with managing director Ira Feinberg to expand the New York-area information technology consulting practice. Previously, Raz was a managing consultant at IBM.

Nolan, Norton is a wholly owned subsidiary of KPMG Peat Marwick, based in Boston.

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Working alone, it would take this man his entire working life (40-50 years) to completely repaint the 10,000,000 sq. ft. Golden Gate Bridge.

Calendar

NOV. 7-NOV. 13

1993 Info/Tech. Phoenix, Nov. 7-10 — Contact: Data Processing Management Association, Park Ridge, Ill. (708) 825-8124.

Back to the Future with Macintosh 1993 Fall Conference. Orlando, Fla., Nov. 7-10 — Con-

tact: Managing Apple Computers in Information Systems (MacIS), Mason, Ohio (513) 398-7500.

Fourth International Conference on Applications of Software Measurement '93. Orlando, Fla., Nov. 7-11 — Contact: Software Quality Engineering, Jacksonville, Fla. (904) 268-8639.

ICCAD '93. International Conference on Computer-Aided Design (ICCAD). Santa Clara, Calif., Nov. 7-11 — Contact: Association for Computer Machinery, New York, N.Y. (212) 869-7440.

First Annual Pan Am EDI Users Conference and Exhibit. Orlando, Fla., Nov. 8-10 — Contact: EDIA/Electronic Data Interchange Pan Am, Conference Registrar, Alexandria, Va. (703) 838-8042.

Pacific Region DB2 Conference. Sydney, Australia,

Nov. 10-12 — Contact: International DB2 Users Group, Chicago, Ill. (312) 527-6777.

13th Annual Eastern America MCR/AT&T Computer User Conference. Lake Harmony, Pa., Nov. 11-12 — Contact: Frank Whalon, Tinius Olsen Testing Machine Co., Willow Grove, Pa. (215) 675-7104.

NOV. 14-NOV. 20

14th Annual Electronic Document Systems Conference & Exhibit. Denver, Nov. 14-19 — Contact: Xplor International, Torrance, Calif. (310) 373-3633.

Xplor '93. Denver, Nov. 14-19 — Contact: Xplor International, Torrance, Calif. (310) 375-4240.

Marketing the IS Organization Internally. St. Louis, Nov. 15-16 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

NOV. 28-DEC. 4

E-Comm '93. Atlanta, Nov. 29-Dec 1. — Contact: E-Comm '93 Conference, Dallas, Texas. (214) 424-0562.

Fourth Annual Computer Fax Conference. Monterey, Calif., Nov. 30-Dec 1 — Contact: BIS Strategic Decisions, Norwell, Mass. (617) 982-9500.

DEC. 5-DEC. 11

Database Marketing Conference & Exposition. Orlando, Fla., Dec. 5-7 — Contact: The National Center For Database Marketing, Stamford, Conn. (212) 972-2410.

Lotus' Notes Users Conference. Lake Buena Vista, Fla., Dec. 5-9 — Contact: Lotusphere '93, Sudbury, Mass. (508) 443-1457.

Computer Measurement Group (CMG): Managing the Wave of Technology. San Diego, Dec. 5-10 — Contact: Computer Measurement Group '93, Chicago, Ill. (708) 655-1812.

Wireless Datacomm '93. Washington, Dec. 6-8 — Contact: Communications Events, Inc., Norwalk, Conn. (203) 847-5131.

"Outsourcing the IS Function." San Francisco, Dec. 8-9 — Contact: International Quality & Productivity Center, Upper Montclair, N.J. (201) 783-4403.

The Outsourcing Conference: "Opportunities, Strategies, Realities." Boston, Dec. 8-9 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Database World. Chicago, Dec. 8-10 — Contact: Digital Equipment Corp., Andover, Mass. (508) 470-3880.

DEC. 12-DEC. 18

Lap and Palmtop Exposition and Conference. Toronto, Dec. 13-14 — Contact: Laptop Expositions, New York, N.Y. (212) 682-7968.

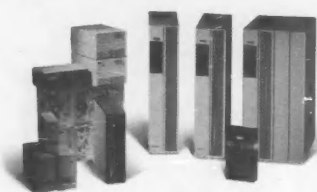
JAN. 9-JAN. 15, 1994

Object World. Boston, Jan. 10-13 — Contact: IDG World Expo, Framingham, Mass. (508) 879-6700.

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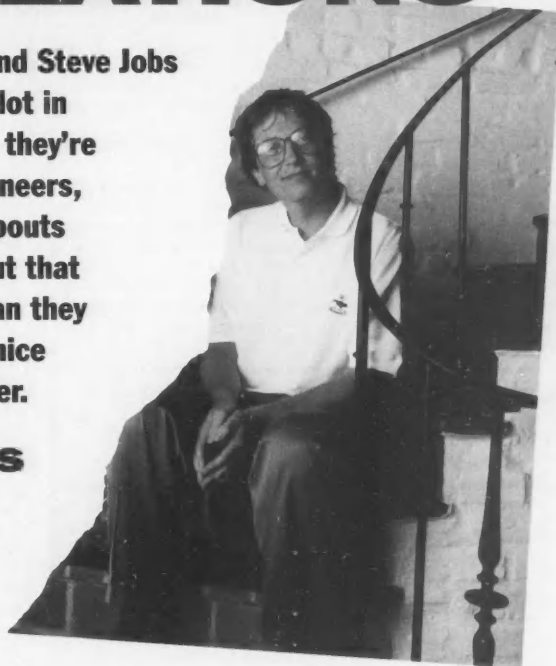
In Depth

STRAINED RELATIONS



Bill Gates and Steve Jobs may have a lot in common — they're both PC pioneers, college dropouts and rich. But that doesn't mean they have to be nice to each other.

BY RANDALL E. STROSS



Repetition of the Macintosh success [with Next, Inc.] would have been difficult enough to achieve even if Steve Jobs had made the correct call on every decision that came before him. He failed, however, to appreciate fully the importance of enlisting the outside support of Bill Gates' Microsoft Corp. or a similar software company to ensure that there would be plenty of software available when a new computer

This is an excerpt from Randall E. Stross' forthcoming book *Steve Jobs and the Next Big Thing* to be published by Atheneum in late November. (Copyright 1993 by Randall E. Stross.) Stross is a professor of international business at San Jose State University.

standard, incompatible with existing ones, was introduced to the public.

Gates' willingness to begin work on software development for the Macintosh prior to its introduction in 1984 had been instrumental to its success, but this time Jobs did not succeed in obtaining the assistance of Gates and Microsoft.

He did not try very hard, either. When Gates visited Next's offices in the summer of 1987, while the Next computer was under development, Jobs let him sit in the

lobby for a half-hour while Jobs moved conspicuously about the building, letting his visitor stew. Jobs' subordinates were amused to see Jobs deliberately keep Gates waiting, which was a way of Next telling Microsoft that Next did not really need the software company's help.

But the play was more than an act of discourtesy. It was the prelude to what would later become an acrimonious competition between the two men for the

Strained relations, page 110

Photos by Graham Lewis/Corbis

Strained relations

CONTINUED FROM PAGE 109

power to direct the PC industry, which had grown manifold since their earlier collaboration, when Jobs was still at Apple.

When Jobs finally unveiled the Next machine to the general public in late 1988, Gates said with derision about his rival, "He put a microprocessor in a box. So what?" Asked about the Next computer's disk drive, which was new for PCs and used optical technology supplied by the Japanese, Gates sneered, "Anybody can write Sony a check." (For the record, the check went to Canon, not Sony.) The all-black design did not impress him, either. Gates: "If you want black, I'll get you a can of paint." Would he develop software for Jobs' new machine? "Develop for it? I'll piss on it."

The industry consumed these remarks as delectable morsels; it also saw them as understandable, given the many threats that Microsoft already faced on a number of fronts, from a strained relationship with IBM and legal conflicts with Apple to uncertain prospects for new software called Windows and now Jobs' new machine, which invited the world to abandon the software the Macintosh provided and use a new standard.

Next had ominously secured the imprimatur of Microsoft's most important partner—IBM, no less. In October 1988, one industry analyst went so far as to say that the new IBM/Next relationship "was the biggest risk that Microsoft has, and Gates is doing all he can to undermine it."

The public feud between Gates and Jobs continued on through the following year. Gates dismissed the new technical

GATES THE MONEY CHASE JOBS

<p>1975 Bill Gates and Paul Allen co-found Microsoft.</p> <p>1986 Gates, 30, debuts on the <i>Forbes</i> list with shares worth \$315 million.</p> <p>1991 Listed No. 2 in <i>Forbes</i> with stock valued at \$4.8 billion.</p> <p>1992 Tops <i>Forbes</i> list with paper value beyond \$6 billion.</p> <p>1993 Estimated worth: \$6.16 billion.</p>	<p>1977 Steve Jobs and Steve Wozniak move Apple from a garage to an office.</p> <p>1980 Apple annual sales reach \$120 million; company goes public.</p> <p>1982 Jobs, 27, listed on the <i>Forbes</i> 400 list with Apple stock valued at \$100 million.</p> <p>1983 Jobs' stock hits \$225 million.</p> <p>1985 Jobs resigns; gets dropped from <i>Forbes</i> list.</p>
---	--

"All I'm thinking and dreaming about is selling software, not stock."

(Hard Drive, by James Wallace and Jim Erickson, HarperBusiness, 1992)

"Computers and society are out on a first date in this decade, and for some crazy reason, we're in the right place at the right time to make that romance blossom."

(Rolling Stone, March 1984)

Source: All information (except quote) from *Steve Jobs and the Next Big Thing* (Atheneum, 1993)

features that the Next computer boasted as "truly trivial," and later, when Gates and Jobs found themselves sitting on a dais at a PC industry meeting, the two traded shots over the head of the hapless representative from IBM, James Cannavino, who sat between them. Cannavino said he felt like he was in Reirut.

It was Jobs, however, more than Gates who was most damaged by their estrangement. When Gates shunned the Next computer, Next was deprived of Microsoft's considerable resources for new software development, which it desperately needed. And Gates' cold response also sent a message to other interested parties that Next's place in the PC galaxy would be marginal.

Everyone knew that Gates took a considerable risk in backing the Macintosh when it was first introduced. Thus, his refusal to back Jobs this time was read as evidence that Next would be hobbled by a crippling handicap with which Apple had never had to contend.

[Yet] Jobs was unconcerned: His motto was "Build it and they will come." But hardly anyone came when the machine was introduced in 1988. Nor did they come in 1989. Jobs was so slow to perceive how grave was the failure that it was not until 1990 that he threw out the old plan and cobbled together a new one, and another and another, right up to the present.

Balancing things out

[But] Jobs has a strength that has helped redress the imbalance of power and money that had come to separate the two boy wonders: Jobs was the revolutionary, the person who had staked out for himself the mission of coaxing the world along with him to take great leaps forward in computer technology.

Gates, in contrast, stood by what he called an evolutionary approach, improving existing software incrementally and permitting computer users to keep their older PC longer. When Microsoft in-

troduced a new kind of software program, more often than not it would be deeply flawed. But successive versions would eliminate the problems, and by dint of steady investment and persistence, the program would mature into a well-received product.

It is fitting that Jobs and Gates be treated as a royal pair. The pattern that the two have set is this: Jobs blazes the trail, and Gates comes behind, incorporating Jobs' revolutionary leap in more modest fashion but one that appeals to the millions of computer users who are reluctant to jettison past investments.

When Gates and Jobs got together in 1991 at Jobs' home for a *Fortune* magazine story on the occasion of the 10th anniversary of the IBM Personal Computer, the shift in power toward those who controlled software instead of those who made computers themselves was already evident. IBM's absence from the birthday cover story for its own Personal Computer and the substitution of Jobs and Gates was an indication of how the computer industry had changed.

So, too, was the softening of contention between Jobs and Gates themselves. Jobs still hoped to enlist Gates in his cause, and Gates, for his part, no longer had as much reason to be concerned about losing IBM's monogamous commitment to Microsoft; the two companies' formerly close relationship had ruptured, and it looked as if Microsoft was in a much better position after the split with IBM.

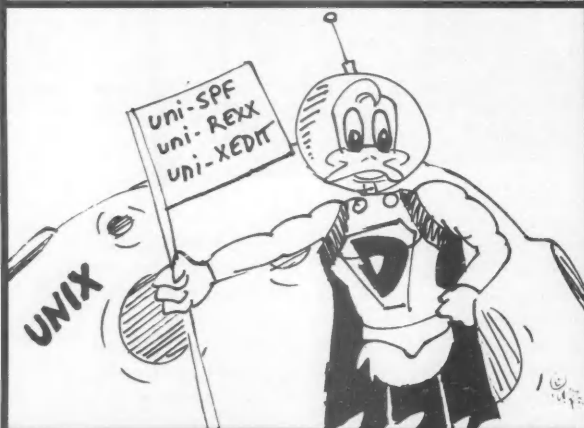
In 1988, when it appeared that IBM might make Next software a new standard for its own computers, Gates had derisively dismissed Next. Three years later, alignments had changed to such a degree, and Microsoft's power had grown to such an extent, that Gates could afford to talk with Jobs about Next without the rancor and perception of personal challenge.

Each declared to the other that the press had invented animosities and had erroneously assumed they were no longer friends. These were declarations that required historical amnesia but were fair indications that, at least at that moment in 1991, both preferred amity to enmity. Though this private meeting was the first in a long while, the two had maintained a wary friendliness with periodic conversations by phone, which were more often than not entreaties from Jobs for Gates to reconsider his declaration that Microsoft would consider writing software only for a computer that had sold 1 million machines, a milestone that, for Next, was impossibly far off. [In fact, to date, Next has sold approximately 50,000 machines.]

At the end of their chat in 1991, however, Jobs had failed once again to enlist Gates' help, and by the next year was speaking publicly about the dire threat posed to the world by the "Microsoft monopoly."

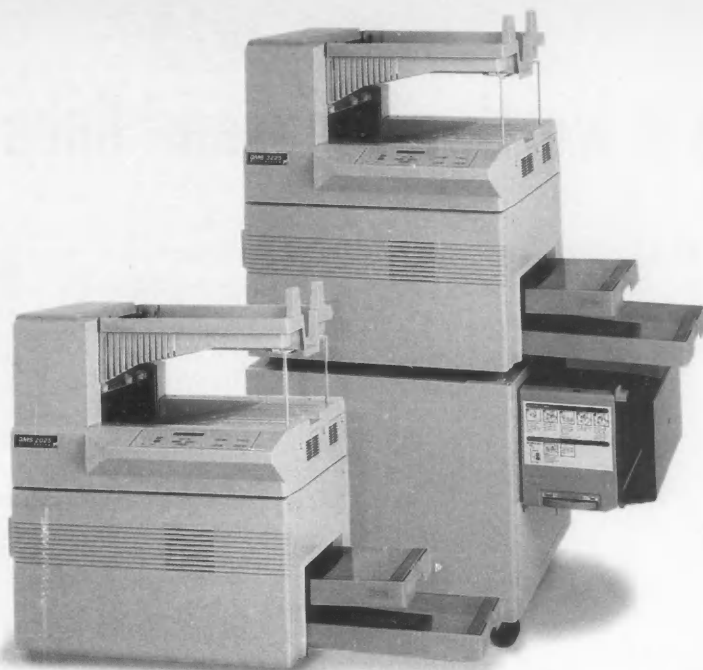
When Jobs appeared at a meeting of the Bay Area Next Group [in 1993], he brushed aside suggestions that Next should consider licensing its software to Microsoft. It made no sense, he said, to aid the enemy.

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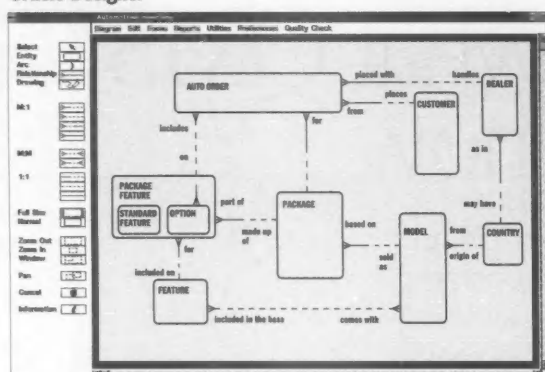
A picture is worth ^{25,000} ~~a thousand~~ lines of code.

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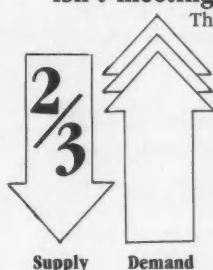
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely is competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better — and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore

That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who



For every 10 of today's computer job seekers...

2 are Active	<input type="checkbox"/>
7 are Passive	<input type="checkbox"/>
1 is a Non-mover	<input type="checkbox"/>

would consider new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that

reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

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A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.



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And while times may change, some things won't. Whether you use computers, make computers, or sell products and services for computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.



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Computer Careers

THE MANAGEMENT TRANSITION

Managers hesitate to give up technical immersion but accept it as a reality of getting ahead

By Leslie Goff

IT'S THE WAY OF THE WORLD: You gain something, you lose something. So it goes for information systems professionals who rise through the technical ranks to management positions.

Managers say they gain in terms of visibility and influence in the organization, long-term career growth, salary, benefits and overall job satisfaction. At the same time, they struggle with giving up their daily technical responsibilities and the shifting relationships with former peers who are now their direct reports.

"Given the technology treadmill that most IS staffers are on, it's a difficult transition to make," says Richard DeFiore, president of Interpersonal Technology Group in Rockville Center, N.Y., and the leader of a "Transition to Management" workshop.

DeFiore says many recently promoted first-line managers have trouble letting go of their old jobs because of their love of technology—the reason they chose an IS career in the first place.

"It's hard keeping your hands off the hands-on," says Daniel Townsend, manager of network operations at Yellow Technology Services, the IS division of Yellow Corp. in Overland Park, Kan.

"I wanted to try to do both," Townsend says. "I was trying to remain a technical person more than I was trying to become a manager. Ultimately, you have to sever the cord and have faith in your people."

Townsend says after becoming overburdened at work, he grew to see his position as that of a catalyst: "I have to motivate my staff to be conscious of doing a good job."

NEED to KNOW

Mary Hopkins, IS manager at Herr-Voss Corp. in Callery, Pa., says she moved into IS from accounting because of the increased opportunities for women in management, but she misses "the element of creativity when you sit down to write a program from scratch. I still do the system design, but I let them write the program. I'm just giving them the pieces to work with."

Out of touch

Learning to give up the close contact with technology is a double-edged sword. As they become more adept at managing people, managers say they have less time to keep up with advanced and

emerging technologies, which creates a different set of anxieties.

"When I have less time to work on technology, I feel a little more distanced from the state of the art," says Rick Ulene, manager of information services at Advanced Sterilization Products, a division of Johnson & Johnson Medical, Inc. in Irvine, Calif. "That's anxiety-provoking because, in theory, the people at the top of IS should be the most knowledgeable about what's out there."

If moving into management requires you to give up what you love most and, in the process, acquire a whole new set of anxieties, why do people do it? In most organizations, moving into management

is the only way for IS staffers to advance.

While some companies say they offer dual career paths—one for aspiring managers and one for IS staff members who wish to remain technical but want to advance their position—DeFiore says the technical path seldom extends beyond the group project leader, a lower middle management position.

"From an advancement standpoint, management seemed the way to go, and it was something different," says Robert Duncan, IS manager at the Price Candy Co. in Kansas City, Mo. "There wasn't a lot of choice at the firms I've been in."

Goff is a free-lance writer in New York.

IS managers contacted for this article were asked the following questions. Responses were ranked according to frequency.

Most difficult aspects of the transition to management:

- Giving up hands-on experience with technology and interaction with users.
- Dealing with changing relationships with former peers who are now subordinates.
- Having less time to keep up with advanced technologies.
- Assuming accountability for the organization.
- Dealing with management politics.

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From LAN neophyte to expert



ONE IS PROFESSIONAL'S TRANSITION

By Daniel Douglas

Whether you want to or not, you could be asked to administer your company's LAN. If your networking skills are limited, you may question whether to accept the challenge or bow out gracefully. Three years ago, I faced a similar situation, but I took the challenge, and I'm still here to talk about it.

My company was installing a LAN at two remote offices. I was asked to provide LAN training and assist the network managers with software and hardware installation, systems administration and PC configuration at both sites. In one month, I needed to be up to speed on Novell, Inc.'s NetWare management, network performance monitoring and hardware installation.

My only network experience came from working one year on our help desk for our 500-node NetWare LAN. I could install and configure PCs and software and do some programming, but I knew little of what went on in a networked environment.

One of my first tasks was to set up a modem pool, which I had never done before. I had to learn the basics of NetWare Asynchronous Communications Services (NACS), the software that allows or-

dinary modems to be shared by network users. I also had to set users up on the LAN, install gateways, ensure system security and keep up with LAN backup. Since I already knew the basics of PC-to-PC communications, I focused my atten-

tion on learning how to use the communications packages and modems across a network.

At the same time, we were setting up an MCI Mail gateway to our electronic-mail system, adding documents from the old system and installing hardware I'd never seen before to access our IBM System/38. I felt overwhelmed.

Doing the homework

I started by reading Novell's manuals for NACS and the related hardware. The manuals gave me the installation basics but glossed over the administration of the NACS server.

I also logged onto CompuServe, read the messages in one of its forums called NetWire and did a specific search on the

setup and administration of NACS. For starters, I wanted to know whether users could be restricted from running multiple sessions, tying up two or more modems in the pool.

When I finally set up the communications software and the wide-area network interface module board for the NACS, I realized that setting up modem pools wasn't as difficult as I had thought. The MCI Mail gateway setup was also easy—I simply read the documentation and called the vendor's support line.

The most challenging task I encountered was with the router for the WAN connection between all the offices, which was to link the E-mail and the billing system. I had no clue how we made or maintained the connection, but our systems analyst guided me through the basics.

Stick to the critical

My biggest mistake was trying to do too much at once. Instead of sticking to the critical issues, I strayed.

For instance, I attempted to change an already installed and working application to what I thought was a more logical approach. Instead of helping matters, I brought the application to a halt. Despite the fact that I should never have attempted this without backing up the application (and was too green to know this at the time), there were more important network problems on the table.

With that said, take heart. Whether you're thrown into this situation or you gladly accept it, take a deep breath, roll up your sleeves and grab the documentation. You can really grasp enough to get you through. I did.

Douglas is a LAN analyst at a major law firm in Washington. He can be reached on CompuServe at 75530.2611.

FOR THE UNINITIATED

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I found the forums to be helpful, especially when I was updating Novell's driver software, which can be downloaded from CompuServe.

■ Read. You've probably heard that vendor manuals, especially Novell's, are disorganized, but they got me through the basics of setting up its NetWare NACS and gave a bare bones description of NetWare system management and the use of related utilities.

■ Attend seminars and user groups for your network type. I knew at some point our LAN would migrate to a Windows

front end, and I got advice on what to expect.

■ Concentrate on the mission-critical. I needed to stabilize the installed software, ensure network security and continue installing software and hardware.

■ If it isn't broke, don't fix it. I knew that there was a way to tweak the system so that when users incorrectly entered their log-ons or passwords, they returned to the log-on prompt. Instead of making it easy, however, I placed them in a continuous loop that kept them from logging on at all. I should have saved this until I had time to do it right.

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large-scale computers	58,896
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small-scale computers	39,210
personal computers	58,385
technical workstations	27,361
Software Vendor	218,027
for large-scale systems	90,605
for medium-scale systems	68,763
for small-scale systems	58,422
for personal computers	97,695
for technical workstations	33,217
Non-CPU Computer	
Products Manufacturer	42,051
VAR/Distributor/Retailer	27,772
DP Service Bureau/	
Contract DP Services	71,293
Consulting/Planning	76,848
Manufacturer (not computer)	202,131
Insurance	91,117
Healthcare	48,866
Banking/Financial Services	116,696
Government Federal/State/Local	114,677
Business Service (except DP)	63,793
Communications Systems	55,744
Public Utilities	24,931
Transportation	51,533
Wholesale/Retail Trade	107,725
Education	92,761

SOURCE: Skill Survey of Computerworld's Audience, August 1992.

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- Conduct sales presentations

Requirements:

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- Proven track record of overachievement of quota
- Strong technical aptitude
- Excellent organizational and presentation skills

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- Manage systems consultants
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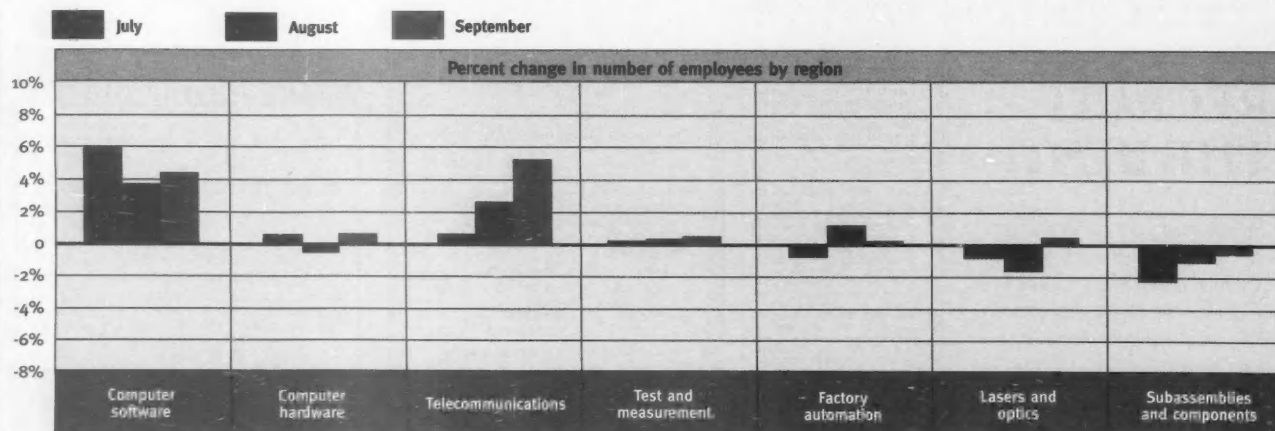
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Computerworld/CorpTech Career Index

Telecommunications industry employment grew more than 5% in September, while most other segments recovered slightly from a difficult summer



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Hardware	IBM PC Compatible Hewlett-Packard	507,673 146,361
Languages/ Utilities	Cobol C	405,325 160,295
Operating Systems	Windows MS-DOS	327,404 504,203
Databases	DB2 dBase	180,974 292,486
Communications	CICS Netview	343,327 99,769
Local Area Networks (LANs)	Novell/Netware Ethernet	417,231 284,616

SOURCE: Skill Survey of Computerworld's Audience, August 1992.

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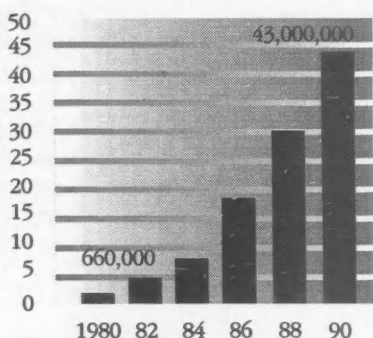
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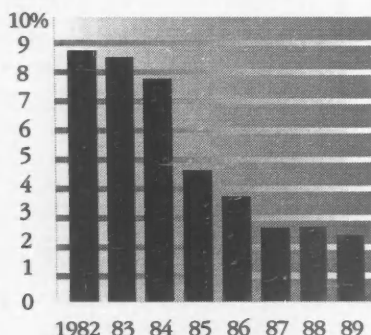
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And so are hundreds of thousands of others with skills from DB2 to IBM S/38 to Unix. How? Call us and we'll show you.

Computerworld reaches professionals with key skills

- a few examples from our survey-

Skill/Product	Product type	Experts in Computerworld's Audience
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IBM (all but PC)	hardware	488,965
Digital Equip. Corp.	hardware	214,375
MVS	operating system	257,248
Cobol	language/utility	443,166

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Marketplace

INSTALLED reality

By Alan Radding



How open is an open system? You might as well ask how many angels can dance on the head of a pin. Both defy an easy answer. Yet with every hardware and software vendor claiming openness and even patently proprietary systems waving the open banner, every company must find a mechanism to define and determine the openness of any proposed solution.

Recently, Dataquest, Inc., a technology research firm in Framingham, Mass., wrestled with the problem in a report on open systems service and support. Not surprisingly, it found that "open systems" means something different to every customer.

Users generally adopt one of three definitions of openness:

- Systems that comply with widely accepted public standards such as TCP/IP or Posix.
- Systems that comply with a widely accepted but proprietary environment, such as Windows, Novell, Inc.'s NetWare or IBM's AS/400.
- Openness as interoperability — systems that interoperate with whatever system the organization currently has.

For example, Alamo Rent A Car, Inc. in Fort Lauderdale, Fla., falls squarely into the second camp. "To me, popular is more important than open. If a platform is popular, it has lots of vendor support, lots of add-ons and peripherals. If I were betting, one popular beats three opens any day," says Tom Loane, vice president of computer services.

Information systems managers cut through the hype of open systems promises

Based on their popularity and widespread use, Loane says he considers Alamo's CICS systems, PCs and AS/400 to be as open as anything else, "although that's not the classic definition," he concedes. But each group of systems has many hardware and software options available from multiple vendors.

Today, users have grown skeptical, if not downright cynical, of vendor claims of openness, interoperability and compatibility.

Masking the truth

"We're not really getting open systems from vendors. At best, we're getting APIs that mask proprietary structures. We don't even ask vendors to provide open systems anymore," says Joseph Vincent, director of technical services at Humana, Inc. in Louisville, Ky.

Without agreement about what constitutes an open system, information systems managers have had to develop their own ways to screen and evaluate vendor claims. Some put the burden of proof on the vendor, others rely on detailed specifications and still others do informal testing or go so far as to organize full-blown compatibility test labs. Each approach, however, presents problems (see chart at right).

Most companies rely on specifications. "In a very general sense, we've defined open as Unix, and we

find [System V Release 4] pretty predictable," reports Dave Sluyter, project leader at Liberty Mutual Insurance Co. in Boston. But just specifying System V Release 4-compliance doesn't guarantee easy interoperability. Liberty Mutual found enough variation among System V Release 4 implementations to cause problems. In response, the company standardized on IBM's AIX.

"Open can mean many things, therefore you need your own benchmark," says Richard Lester, vice president of information services at Associated Grocers, Inc. in Seattle. He says he believes the best benchmark to measure openness is compliance with the Open Software Foundation's Distributed Computing Environment (DCE). The only problem is that very few products are DCE-compliant. Often Lester has to settle on "a commitment to do it within a year or so."

Because specifying standards alone doesn't guarantee interoperability, it must be combined with actual testing. "We are moving to open systems, and we are starting by specifying standards: Unix for database servers and TCP/IP [for connectivity]," says Greg Chetel, director of systems planning and research

beware evasions

WHEN YOU HEAR THE FOLLOWING, TURN YOUR SKEPTICISM ON

ONLY BINARY COMPATIBILITY INSURES DIRECT INTEROPERABILITY BETWEEN ONE UNIX AND ANOTHER. UNIX IS ONLY A SHADE MORE OPEN THAN, SAY, DOS.

THIS IS NOT THE SAME AS DELIVERING OPEN SYSTEMS. PIN DOWN THE SPECIFICS: WHAT AND WHEN.

THIS GIVES YOU COMPLIANCE WITH AN OFFICIALLY SANCTIONED STANDARD, BUT YOU WON'T HAVE MUCH CHOICE IN TERMS OF PRODUCTS OR COMPLETE SOLUTIONS, AT LEAST IN THE SHORT TERM.

EVERY VENDOR HAS ITS OWN IMPLEMENTATION OF SQL, AND MIDDLEWARE IS USUALLY REQUIRED TO BRIDGE THE DIFFERENCES.

APIs AREN'T A PANACEA. THEY MASK UNDERLYING PROPRIETARY STRUCTURES AND INTRODUCE ANOTHER LAYER OF PROCESSING AND COMPLEXITY. AT BEST, THEY ARE AN INTERIM STEP ON THE WAY TO TRUE OPENNESS.

at Gillette Co. in Boston. However, Gillette has found that although "everybody claims openness and compatibility with your standards, the only way you can really tell is to try it."

Few companies today, however, can afford an extensive enough systems research and development effort to allow for comprehensive compatibility testing, says Bob Walsh, principal at Practice Corp. in Mansfield, Mass. Instead, companies are conducting informal testing as part of system implementation or dropping the burden into vendors' laps.

Gillette, for instance, has set aside a small group of facilities to test systems and leaves it to the project team to ensure that the technology works together.

Ultimately, managers try to throw the open systems ball back to the vendor. "If they want the order, they have to make sure it works," Loane says.

Radding is a free-lance writer in Newton, Mass.

ensuring open systems

MANAGERS TAKE SEVERAL APPROACHES TO ENSURE COMPLIANCE WITH THEIR SYSTEMS PLANS. EACH HAS ADVANTAGES AND DISADVANTAGES.

relying on the vendor

ADVANTAGES: EASY. VENDOR SUPPORTS IT.
DISADVANTAGES: MAY NOT DELIVER EXPECTED RESULTS. NO CONTROL OF YOUR ARCHITECTURE.

specifying standards

ADVANTAGES: LOW COST. MAINTAIN CONTROL OF INFRASTRUCTURE ARCHITECTURE.
DISADVANTAGES: HIGH-LEVEL SPECIFICATIONS DON'T GUARANTEE INTEROPERABILITY.

testing

ADVANTAGES: KNOW THAT IT WORKS.
DISADVANTAGES: COSTLY. TIME-CONSUMING.

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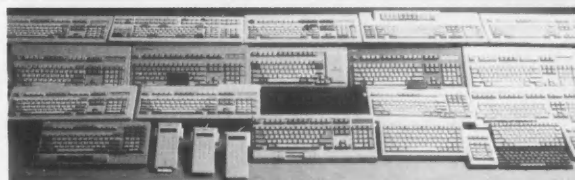
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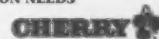
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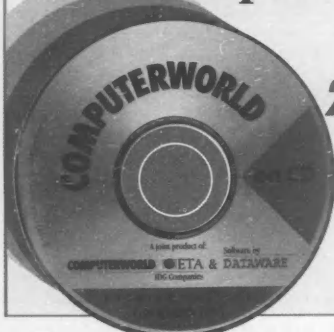
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Prosigna 486/66	\$4,200	\$3,900
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Canadian Railroad	1	IBM	1,6,10,14,46,48,51, 67,72,92,93,100,109,133	Pacific Bell	1,79	Valero Energy Corp.	97
Capital Holding Corp.	48	Illig, Inc.	99	Packard Bell Electronics	16	VeriFone, Inc.	83
Cargill, Inc.	10	Inform Technology Decisions, Inc.	14	PeerLogic, Inc.	87,133	Verity, Inc.	99
Chevron Corp.	72	Informix Software, Inc.	20	PeopleSoft, Inc.	16	Vertical Systems Group	12,79
Chicago Board of Trade	71	Intel Corp.	10,24,45,62,67,88,97	Peregrine Systems, Inc.	14	Viacom International, Inc.	102
Cisco Systems, Inc.	83	Interleaf, Inc.	53	Performance Computing	97	Viasoft, Inc.	100
Citgo Petroleum Corp.	1	Intermountain Health Care, Inc.	28	Popkin Software & Systems, Inc.	100	Vixis Software, Inc.	87,100
Communication Intelligence Corp.	50	International Data Corp.	1,45,62	Powersoft Corp.	20,97,98,100	W	
Communications Network Architects, Inc.	4,10	Interpersonal Technology Group	114	Practice Corp.	121	Wang Laboratories, Inc.	10,134
Compaq Computer Corp.	1,16,62	Intersolv, Inc.	C97	Price Candy Co.	114	Wausau Insurance Co.	88
CompuAdd Computer Corp.	1	J		Price Waterhouse	57	Weizer Associates, Inc.	20
Computer Associates International, Inc.	1,87,99	J. P. Morgan	100	Procase Corp.	100	Wellfleet Communications, Inc.	14
Computer Intelligence/InfoCorp	24,45	Jet Propulsion Laboratories	97	Progressive Corp.	87	Westinghouse Electric Corp.	1
Computer Sciences Corp.	83	Johnson & Johnson Medical, Inc.	114	Proxim, Inc.	16	Weyhauser Co.	53
Computron Technologies Corp.	67	Jupiter Communications Co.	103	Pure Software, Inc.	100	Whirlpool Corp.	1
Compuware Corp.	67	K		Putnam Investments	53	WITel	79
Converse, Inc.	133	Kash n' Karry Food Stores, Inc.	72	R		Wingate Technologies	99
Coopers & Lybrand	102,103	Kenneth O. Zoline and Associates	71	RAM Mobile Data	83,134	Wishard Memorial Hospital	28
Corporate Association for Microcomputer Professionals	71	Kidder, Peabody & Co.	1	Rapport Communication	71	WordPerfect Corp.	16
Covia Technologies	133	Kmart Corp.	57	Reuters America, Inc.	83	WorkGroup Technologies, Inc.	1
Cox Enterprises, Inc.	102	KnowledgeWare, Inc.	99,100	Rockwell International, Inc.	6,83	X	
Cray Research, Inc.	16	Kontek Industries	62	S		X Consortium	72
D		KPMG Peat Marwick	1	Salomon Brothers, Inc.	1	XcalleNet	83
Data General Corp.	57	L		Sara Lee Corp.	1	Xerox Corp.	16
Database Server Systems, Inc.	98	Legent Corp.	87,92,97	SaskTel	1	XLI Corp.	67
Dataquest, Inc.	1,12,100	Liberty Mutual Insurance Co.	121	Search Software America	83	Y	
Dauphin Technology	48	LightStream Corp.	16	Sequent Computer Systems, Inc.	98	Yellow Corp.	114
DayStar Digital	46	Link Resources Corp.	102,103	T		Yside	1
Decatur	1	M		Salomon Brothers, Inc.	1	Z	
Dell Computer Corp.	1,16,45	Madge Networks, Inc.	10	Sara Lee Corp.	1	Zenith Data Systems	1,16
		Magie Valley Regional Medical Center	28	SaskTel	1	Zeos International Ltd.	1
		Manager Software Products, Inc.	99	Search Software America	83		
		Maytech, Inc.	48	Sequent Computer Systems, Inc.	98		
		Memorex Telex	14				
		Meridian Bancorp.	104				
		Meta Group, Inc.	12				
		MFS Datanet, Inc.	79				
		Micro Focus, Inc.	100				
		Microsoft Corp.	1,4,12,45,51,53,62, 92,93,97,98,99,109,134				
		Moda Systems, Inc.	16				
		Momentum Software Corp.	133				
		Montage Software, Inc.	50				
		Morgan Lewis & Bockius	53				
		Motorola Codex	12				
		Motorola Satellite Communications, Inc.	83				
		Motorola, Inc.	1,12,46,83				
		Mutual Life of Canada	98				
		N					
		National Association of Securities Dealers	48				
		National Semiconductor Corp.	10				
		Nationwide Group	88				
		NCR Corp.	10,57,72,92				
		NCube, Inc.	98				
		NetLAN, Inc.	10				
		Network Computing Devices, Inc.	72				
		Network Equipment Technologies, Inc.	16				
		New Science Associates, Inc.	53,98				
		Next Computer, Inc.	109				
		Nexel Communications, Inc.	83				
		Northeast Utilities System	12				
		Northern Telecom, Inc.	14				
		Northern Western University	71				
		Novell, Inc.	1,4,10,14,51,53,62,83,134				
		Nu-Mega Technologies, Inc.	51				
		O					
		Object Database Management Group	10				
		Objectivity, Inc.	98				
		Ontario Hydro Corp.	100				
		Open Software Foundation	87,92				
		Optical Data Systems, Inc.	83				
		Oracle Corp.	1,10,20,88,97,98				
		Ouellette & Associates Consulting, Inc.	1				
		P					
		Pacific Bell	1,79				
		Packard Bell Electronics	16				
		PeerLogic, Inc.	87,133				
		PeopleSoft, Inc.	16				
		Peregrine Systems, Inc.	14				
		Performance Computing	97				
		Popkin Software & Systems, Inc.	100				
		Powersoft Corp.	20,97,98,100				
		Practice Corp.	121				
		Price Candy Co.	114				
		Price Waterhouse	57				
		Procase Corp.	100				
		Progressive Corp.	87				
		Proxim, Inc.	16				
		Pure Software, Inc.	100				
		Putnam Investments	53				
		R					
		RAM Mobile Data	83,134				
		Rapport Communication	71				
		Reuters America, Inc.	83				
		Rockwell International, Inc.	6,83				
		S					
		Salomon Brothers, Inc.	1				
		Sara Lee Corp.	1				
		SaskTel	1				
		Search Software America	83				
		Sequent Computer Systems, Inc.	98				

Friday Stock Ticker

Gainers Losers

Percent

CAMBER CORP.	77.8	LATTICE SEMICONDUCTOR	-28.2
CORINTECH CORP.	54.3	PLATINUM TECHNOLOGY (L)	-25.3
CORPORATE SOFTWARE (H)	31.1	ATMEL CORP.	-24.3
RADIUS INC.	31.0	PLATINUM SOFTWARE (H)	-23.4
WORDSTAR (L)	28.1	ARTEL COMMUNICATION CORP. (H)	-23.1
PENRIL DATA COMM NETWORKS	27.5	GROUP 1 SOFTWARE	-22.0
SPINAKER SOFTWARE	21.7	CE SOFTWARE	-16.4
AMERICAN MGMT. SYSTEMS	17.7	STRATACOM INC. (H)	-15.2
TANDY CORP.	3.63	NEWBRIDGE NETWORKS CORP.	-9.00
CORPORATE SOFTWARE (H)	3.50	PLATINUM SOFTWARE (H)	-8.25
COMPAQ COMPUTER CORP. (H)	3.50	ATMEL CORP.	-7.88
AMERICAN MGMT. SYSTEMS	3.25	LATTICE SEMICONDUCTOR	-6.38
COMPUTER ASSOCIATES	3.13	PROGRESS SOFTWARE CORP.	-6.25
CAMBER CORP.	3.06	CABLEVISION SYSTEMS	-5.88
FILENET CORP.	2.50	US ROBOTICS	-5.00
HEWLETT PACKARD CO.	2.38	ZILOG INC. (H)	-4.75

BIG NEWS WAS GOOD NEWS FOR CAMBER LAST WEEK. WHILE EARNINGS REMAIN (COMPAQ, COMPUTER ASSOCIATES) IN THE RED (WORDSTAR, SPINAKER) HAVE MANY STOCKS, CAMBER HAD NOTHING TO REPORT, CAMBER'S EARNINGS RISE DUE NEXT WEEK.

Dollar

Creative arguments

The company that makes the Sound Blaster PC add-in card — Creative Technology (CREAF), parent of subsidiary Creative Labs — has enjoyed an upward surge on the stock market.

Creative Technology owns as much as 70% of the rapidly expanding PC sound card market and also does a healthy business in full PC multimedia upgrade kits. The company reported quarterly results after the market closed Thursday. Revenue was up 156% from the year-ago quarter at \$112.9 million. Net income improved 100% to \$21.2 million.

Creative Technology has its share of skeptics, though.

According to Carl Wittebert, an analyst for the newsletter "Market Trim Tabs" in Santa Rosa, Calif., Creative Technology is overly dependent on a single product, and margins and market share for the Sound Blaster are likely to fall significantly as competition from Media Vision, Inc. (MVIS), Cardinal Technologies, Inc. and others heats up the PC sound marketplace. Wittebert also said Creative Technology invests very little in research and development, which makes the company vulnerable to digital signal processor technology from other companies.

"Market Trim Tabs" currently carries a "Short" recommendation on Creative Technology's shares, which essentially means the newsletter expects the price to drop.

Media Vision's financial report last week provided evidence that Creative Technology does not have a stranglehold on the sound market. Media Vision's sales were up about 400% over last year's third quarter. The company posted earnings per share of 36 cents, compared with 3 cents in 1992. Media Vision's stock hiked up 2% to reach 33 1/2 the day of the announcement.

However, Alex Brown & Sons, Inc. analyst Steven Eskenazi said the market is growing so rapidly that Creative Technology can still hit Wall Street's high expectations even though the company is losing market share.

"It's hard to see much erosion in a market that's growing in triple digits," Eskenazi said. "This is Creative and Media Vision, not Creative vs. Media Vision," he said.

Eskenazi also noted that the company has moved this year to broaden its product line, acquiring videoconferencing vendor ShareVision and professional audio equipment maker E-Mu Systems.

—Derek Slater

52-WEEK RANGE	EXCH	52-WK RANGE	OCT 22 WK NET	WK PCT	3 PM	CHANGE	52-WK RANGE	EXCH	52-WK RANGE	OCT 22 WK NET	WK PCT	3 PM	CHANGE
Communications and Network Services						OFF -2.88	Semiconductors						OFF -6.61
OTC	40.00 18.38	3 COM CORP.	28.63	-2.88	-9.1		OTC	13.63 4.88	INTERLEAF INC.	15.75	-0.38	-6.1	
NYS	91.13 63.38	AMERICAN INFO TECHS CORP.	83.50	-4.25	-4.8		OTC	16.50 4.75	INTERTECH INC.	6.50	-0.25	-2.9	
NYS	65.00 42.38	AT&T	58.13	-2.63	-4.3		OTC	54.75 15.50	KNOWLEDGEWARE INC. (H)	16.50	-0.25	-1.5	
OTC	4.44 0.75	ARTEL COMMUNICATION CORP. (H)	3.13	-0.94	-23.1		OTC	18.25 7.75	LOTUS DEVELOPMENT (H)	5.25	0.00	0.0	
OTC	24.50 12.50	BANYAN SYSTEMS INC.	19.00	0.00	0.0		OTC	21.25 4.25	MCAE ASSOCIATES	5.75	-0.25	-4.2	
NYS	69.13 44.50	BELL ATLANTIC CORP. (H)	62.88	-4.25	-6.3		OTC	11.63 2.50	MECA SOFTWARE	6.50	0.03	0.5	
NYS	38.88 46.75	BELLSOUTH CORP. (H)	62.25	-1.13	-0.2		OTC	12.75 6.38	MENTOR GRAPHICS (H)	12.38	0.75	6.5	
OTC	14.50 3.75	BOLT, BERANEK & NEWMAN	11.63	1.00	9.4		OTC	46.00 19.75	MICRO FOCUS (L)	24.00	2.13	9.7	
OTC	18.50 9.50	BROOKTRON TECHNOLOGY	10.75	-1.75	-14.0		OTC	13.25 4.38	MICROGRAFX INC.	7.63	-0.63	-7.6	
NYS	119.00 66.00	CABLEVISION SYSTEMS	92.25	-5.88	-5.9		OTC	98.00 70.38	MICROSOFT CORP.	79.75	-2.50	-3.0	
OTC	36.50 8.75	CENTIGRAM COMMUNICATIONS	35.00	-0.75	-2.1		OTC	64.50 18.88	ORACLE CORP. (H)	61.50	-2.88	-4.5	
OTC	55.50 20.25	CHIPCOM CORP.	49.75	-2.75	-5.2		OTC	44.75 22.50	PARAMETRIC TECHNOLOGY (H)	41.88	-2.38	-5.4	
OTC	59.25 28.88	CISCO SYSTEMS INC.	48.75	-1.38	-2.7		OTC	40.50 22.50	PICTORLESS	36.00	-1.25	-3.3	
OTC	17.75 8.00	COMPRESSION LABS INC. (H)	15.58	-1.38	-8.0		OTC	7.13 3.75	PHOENIX TECHNOLOGIES	4.13	-0.25	-5.7	
OTC	36.00 20.75	CROSSCOM	29.25	1.00	3.5		OTC	39.75 13.50	POWERSTOCK	32.25	2.25	7.5	
OTC	4.63 1.88	DATA SWITCH CORP.	2.50	0.00	0.0		OTC	25.00 7.25	PLATINUM SOFTWARE (H)	27.00	-2.50	-23.4	
NYS	19.88 12.38	DIGITAL COMM. ASSOC.	18.63	0.00	0.0		OTC	61.50 32.25	PROGRESS SOFTWARE CORP.	51.00	-6.25	-10.9	
OTC	12.75 3.75	DIGITAL SYSTEMS INT'L INC.	3.88	-0.63	-13.9		OTC	23.50 9.63	QUANTUM SOFTWARE INC.	17.50	0.25	1.5	
OTC	78.13 14.63	DSC COMMUNICATIONS (H)	70.38	-0.75	-1.1		OTC	32.00 16.00	RAINBOW TECHNOLOGIES INC.	20.75	2.00	10.7	
OTC	9.50 4.75	FIBRONIX INT'L INC.	5.00	0.13	2.3		OTC	11.38 4.25	RASTEROPS	7.50	-0.25	-3.2	
OTC	24.00 8.75	FILENET CORP.	17.50	2.50	16.7		OTC	15.25 3.63	ROSS SYSTEMS	12.25	-0.63	-4.9	
OTC	4.38 1.50	GANDALF TECHNOLOGIES INC.	3.13	-0.13	-3.8		OTC	28.75 10.88	SAPIENS INTL. CORP. (H)	27.13	-0.13	-0.5	
OTC	2.06 0.69	GATEWAY COMMUNICATIONS (L)	0.81	0.07	4.1		OTC	14.50 5.50	SOFTWARE PUBLISHING CORP.	7.13	-0.38	-5.6	
ASE	37.75 20.00	GO VIDEO	2.69	0.06	2.4		OTC	15.88 2.63	SOFTWARE TOOLWORKS INC.	15.88	-0.75	-4.5	
NYS	39.88 32.88	GTE CORP. (H)	38.25	-0.63	-1.6		OTC	2.75 0.75	SPINAKER SOFTWARE	2.75	-0.50	-21.7	
NYS	94.75 64.75	ITT CORP.	92.75	0.25	0.3		OTC	13.75 5.75	STATE OF THE ART	9.75	-0.50	-4.9	
OTC	29.88 16.81	MCI COMMUNICATIONS CORP.	28.50	-1.00	-3.4		NYS	31.00 17.63	STERLING SOFTWARE INC. (H)	30.63	1.50	5.2	
OTC	6.50 1.50	MICROLINK SYSTEMS	5.25	-0.13	-4.3		OTC	23.50 9.63	STRUCT. DYNAMICS RESEARCH	18.63	0.25	1.5	
OTC	24.25 3.50	NETRIX CORP.	20.00	-0.25	-4.8		OTC	77.50 38.00	SUNSHINE CORP. (H)	68.75	0.13	0.2	
OTC	19.00 6.50	NETWORK COMPUTING DEVICES	7.50	-0.25	-3.2		OTC	20.50 9.25	SYNTECH CORP.	18.38	-1.63	-8.1	
NYS	12.25 3.38	NETWORK EQUIPMENT TECH.	9.00	-0.50	-5.3		OTC	25.50 10.00	SYSTEM SOFTWARE ASSOC.	0.00	0.00	0.0	
OTC	20.13 6.00	NETWORK GENERAL	14.88	0.63	4.4		OTC	6.50 2.75	TECHNIX CORP. (H)	6.00	0.00	0.0	
OTC	15.75 8.88	NETWORK SYSTEMS CORP.	8.50	0.25	3.0		OTC	26.50 13.50	VIEWLOGIC SYSTEMS	23.13	0.13	0.5	
OTC	73.88 11.19	NEWBRIDGE NETWORKS CORP.	60.38	-0.38	-0.6		OTC	23.50 5.50	WALKER INTERACTIVE SYSTEMS	17.50	0.25	1.5	
NYS	46.00 21.38	NORTHERN TELECOM LTD.	27.00	0.13	0.5		OTC	3.19 0.84	WORDSTAR (L)	2.13	0.28	28.1	
OTC	35.25 17.00	NOVELL INC.	21.63	2.38	12.3								
NYS	48.88 39.50	NYNEX CORP.	43.75	-1.63	-3.6		NYS	32.88 14.25	ADVANCED MICRO DEVICES	20.00	-0.50	-2.4	
OTC	30.00 18.75	OPTEL COMMUNICATIONS CORP.	25.00	-0.13	-0.5		NYS	28.00 11.25	ANALOG DEVICES INC.	5.13	1.25	31.3	
OTC	6.13 3.75	PENRIL DATA COMM NETWORKS	5.50	1.19	27.5		OTC	12.88 4.50	ATMEL CORP.	24.75	-2.88	-24.3	
OTC	30.50 14.00	PICOTEST CORP.	17.50	0.00	0.0		OTC	6.25 2.75	CHIPS AND TECHNOLOGIES	5.25	-0.13	-2.3	
OTC	11.50 3.63	PICTURE INC.	6.38	-0.50	-8.3		OTC	39.75 13.00	CIRCUIS LOGIC	34.00	-1.50	-4.2	
NYS	38.88 17.75	SCIENTIFIC ATLANTA INC. (H)	37.50	-1.38	-3.5		NYS	19.00 11.33	CYPRESS SEMICONDUCTOR CORP.	17.13	-0.63	-3.5	
OTC	47.00 31.75	SOUTHWESTERN BELL CORP.	41.25	-1.38	-3.2		OTC	74.50 32.50	INTEL CORP.	64.50	-1.50	-2.3	
NYS	40.25 24.38	SPIRIT CORP. (H)	16.75	-3.25	-19.2		OTC	7.00	LSI LOGIC CORP.	16.00	-0.50	-3.1	
OTC	17.00 12.50	STANDARD MICROSYSTEMS CORP.	12.25	-2.25	-9.6		OTC	26.75 11.66	LATTICE SEMICONDUCTOR	16.25	-6.38	-28.2	
OTC	29.25 2.25	STRATACOM INC. (H)	16.00	-2.88	-15.2		OTC	63.63 16.25	MICRON TECHNOLOGY	46.00	-1.50	-3.2	
OTC	42.75 18.88	SYNOPSIS COMMUNICATIONS	26.63	0.38	1.4		NYS	107.50 47.38	MOTOROLA INC. (H)	98.75	-0.50	-0.5	
OTC	17.88 2.88	TELEBIT CORP.	3.38	0.63	8.1		OTC	21.75 10.13	NATIONAL SEMICONDUCTOR	16.38	-1.00	-5.8	
OTC	18.88 4.13	TELECOMS INT'L INC.	14.63	-0.63	-4.1		OTC	15.75 6.50	SIERRA SEMICONDUCTOR	3.38	-0.63	-7.8	
OTC	35.25 16.25	TELETYPE CORP.	20.00	-5.00	-25.0		OTC	25.75	SYNOPSIS (H)	24.75	-0.50	-4.6	
NYS	50.63 35.25	U.S. WEST INC. (H)	49.50	-0.50	-1.0		NYS	84.25 45.13	TEXAS INSTRUMENTS	65.25	-3.13	-4.6	
OTC	56.00 23.50	WELLFLEX COMMUNICATIONS	53.25	-0.75	-1.4		OTC	18.88 6.50	VLSI TECHNOLOGY	14.25	0.00	0.0	
OTC	19.50 7.25	XIRCOM	16.75	-1.50	-8.2		OTC	14.38 3.50	WEITZER	19.75	-4.50	-22.8	
PCs and Workstations						UP 3.84	ASE	9.63 3.63	WESTERN DIGITAL CORP.	7.75	1.13	17.0	
OTC	5.56 2.50	ADVANCED LOGIC RESEARCH	3.38	0.50	17.4		OTC	54.50 15.50	XILINK	39.00	-4.25	-9.8	
OTC	6.25 22.00	APPLE COMPUTER INC.	30.00	2.00	7.1		OTC	40.75 18.00	ZILOG INC. (H)	35.00	-4.75	-11.9	
OTC	24.25 12.75	AST RESEARCH INC.	19.00	1.00	5.6								
NYS	9.25 2.50	COMANDUM INC. (H)	3.13	-0.13	-3.8		OTC	24.75 9.25	AMERICAN POWER CONVERSION	21.75	-1.75	-7.4	
OTC	55.50 38.50	COMPAQ COMPUTER CORP. (H)	61.50	5.00	5.6		OTC	22.75 15.50	BANCTEC INC.	20.75	-1.00	-4.6	
OTC	49.88 13.50	DELL COMPUTER CORP.	19.25	0.38	2.0		OTC	18.00 3.50	CANEX CORP.	7.00	3.06	77.8	
OTC	29.25 54.50	EMULX CORP.	22.38	2.38	3.4		OTC	18.00 3.50	CANEX CORP.	7.00	3.06	77.8	
NYS	46.75 23.13	SILICON GRAPHICS (H)	44.50	-1.50	-3.3		NYS	25.50 9.00	CONNER PERIPHERALS	11.00	0.88	8.6	
OTC	41.00 21.13	SUN MICROSYSTEMS INC.	24.75	1.38	5.9		OTC	38.50 17.25	CREATIVE TECHNOLOGIES INC.	27.38	2.38	9.5	
OTC	25.75 24.63	SYNOPSIS COMMUNICATIONS	24.63	3.63	9.8		OTC	30.85	DATA RESEARCH INC.	29.38	1.75	14.6	
OTC	7.00 2.50	ZEOS INTERNATIONAL LTD.	3.00	-0.25	-7.7		ASE	13.25 5.88	DATARAM CORP.	9.63	-0.25	-2.5	
Large Systems						OFF -0.01	NYS	39.00 7.50	EMC CORP. (H)	34.25	-5.00	-11.6	
ASE	8.75 4.38	AMDAHL CORP. (L)	4.81	-0.00	-1.3		OTC	25.00 10.13	EMULEX CORP.	23.00	-0.13	-0.5	
NYS	8.75 3.63	COMDEX CORP.	5.25	-0.13	-2.3		OTC	19.00 14.00	EVANS & SUTHERLAND	18.50	1.50	8.8	
OTC	6.13 2.25	CRAY CORP.	3.13	0.00	0.0		OTC	20.63 7.50	EXARTE	14.00	0.25	1.8	
NYS	30.88 20.25	CRAY RESEARCH INC.	25.50	1.75	7.4		OTC	34.00 10.41	INTELLIGENT INFO. SYSTEMS	23.00	-2.25	-8.9	
NYS	13.88 7.75	DATACORP. CORP.	10.13	0.25	2.5		OTC	9.63 4.50	INTEGRATED SYSTEMS	8.38	-0.63	-6.6	
OTC	40.25 30.38	DIGITAL EQUIPMENT CORP.	35.75	1.63	4.7		OTC	14.25 5.75	IPSYSTEMS INC.	8.75	-0.50	-5.4	
NYS	44.88 32.50	HARRIS CORP. (H)	44.88	1.63	3.8		OTC	24.00 14.25	KOMAG INC.	14.63	-0.50	-3.3	
NYS	69.88 40.63	IBM	44.75	2.25	0.6		OTC	9.63 4.50	KOMAG INC.	14.63	-0.50	-3.3	
NYS	19.75 7.25	KENDALL SQUARE RESEARCH	16.50	-1.50	-8.2		OTC	10.00 5.75	MICROPOLIS CORP.	6.38	0.25	4.4	
NYS	141.50 83.00	MATSHITA ELECTRONICS	137.50	-1.50	-1.1		NYS	117.00 97.25	JMC CORP.	105.88	13.88	13.3	
OTC	23.75 12.00	NETRAME	16.50	-0.13	-0.8		OTC	30.85	QMS INC.	7.00	0.00	0.0	
OTC	41.00 9.25	PARALLAN COMPUTER	22.25	0.75	3.5		NYS	17.25 7.50	QMS INC.	9.00	0.13	1.4	
OTC	23.25 7.75	PYRAMID TECHNOLOGY	15.25	-2.25	-1.6		OTC	17.88 9.38	QUANTUM CORP.	11.50	0.88	8.7	
OTC	24.00 11.25	SEQUENT COMPUTER SYSTEMS	16.88	-0.88	-4.9		OTC	13.13	RECOGNITION EQUIPMENT (H)	11.75	0.13	1.1	
OTC	5.50 1.38	SEQUEST SYSTEMS INC.	3.13	0.00	0.0		OTC	17.75 11.00	RECOGNITION EQUIPMENT (H)	11.75	0.13	0.7	
NYS	41.25 20.25	STRATUS COMPUTER INC.	25.75	-1.25	-4.6		OTC	13.88 7.37	SEAGATE INC.	4.00	0.25	6.7	
NYS	16.88 8.50	TANDEN COMPUTERS INC.	13.13	0.63	5.0		OTC	28.28 13.13	SEAGATE TECHNOLOGY	21.00	1.00	5.0	
OTC	25.50 10.63	TECOCO SYSTEMS (H)	13.13	-1.50	-6.3		OTC	18.00 10.00	STORAGE TECHNOLOGY	15.88	0.88	5.6	
OTC	13.88 8.00	UNISYS CORP.	11.75	-0.13	-1.1		NYS	27.88 17.63	TEROTEC INC.	23.38	0.13	0.5	
Software						UP 1.98%	NYS	88.88 69.88	KENEX CORP.	73.38	0.13	0.2	
OTC	37.00 14.50	AOL SYSTEMS INC.	22.50	0.25	1.1								
OTC	24.25 11.75	ALDUS CORP. (H)	23.00	0.00	0.0		OTC	23.75 14.88	AMERICAN MGMT. SYSTEMS	21.63	3.25	17.7	
OTC	11.25 5.50	AMERICAN SOFTWARE INC.	6.88	-0.25	-3.5		NYS	4.75 2.38	ANACOMP INC.	3.13	0.25	8.7	
OTC	28.13 9.50	ASK COMPUTER SYSTEMS	12.75	0.75	6.3		OTC	23.84 13.16	ANALYSIS INT'L	17.50	0.75	4.5	
OTC	56.75 38.75	AUTODESK INC.	47.25	-0.50	-1.0		NYS	56.13 46.63	AUTO DATA PROCESSING	52.88	0.88	1.6	
OTC	7.75 2.50	BACHMAN INFO. SYSTEMS	3.38	0.13	3.8		OTC	19.00 13.13	CAI COMM. INC.	18.00	-1.63	-3.4	
OTC	24.00 11.25	BGS SYSTEMS INC.	11.25	-0.25	-2.2		OTC	13.38 4.50	COMPUTER HORIZONS (H)	12.00	-1.00	-7.7	
OTC	84.13 38.75	BMC SOFTWARE INC.	56.75	-2.13	-3.6		NYS	9.25 6.00	COMPUTER TASK FORCE CORP.	6.63	-0.25	-3.6	
OTC	28.25 19.00	BOEKE & BAGGAGE	24.25	-0.75	-3.0		OTC	40.50 19.00	COMPUISA INC.	34.25	1.75	6.7	
OTC	18.25 12.75	BORGES INC.											

Computer Industry

Merger boosts fledgling middleware market

Momentum, Horizon union brings together opposites

By Lynda Radosevich

The small, complicated yet rapidly emerging middleware market took a big step last week when two privately held "messaging-oriented" developers agreed to merge.

Horizon Strategies, Inc. in Needham, Mass., and Momentum Software Corp. in Englewood, N.J., will form a company called Momentum Software Corp., located in both places.

The entity combines Horizon's experience in developing peer-to-peer, mainframe-based middleware with Momentum's experience in Unix-oriented middleware for building cross-platform capabilities into applications.

Company officials said the firms joined forces because each was planning to develop what the other already had.

Capital idea

Helping finance the merger was the \$2.7 million that Momentum received from venture capitalists in return for slightly less

Middle ground		
The merger of Horizon Strategies and Momentum Software was driven by product synergies—each wanted to develop what the other already had		
COMPANY	Horizon Strategies, Inc. Needham, Mass.	Momentum Software Corp. Englewood, N.J.
NUMBER OF EMPLOYEES	20	20
FINANCIAL STATUS	Breakeven income 1993	Breakeven income 1993
FOUNDED	1989	1986
MAIN PRODUCT	Message Express	X-IPC
TARGET ENVIRONMENT	Peer-to-peer communications between transaction-processing applications	Communications within a client-server application that crosses workstation and desktop applications

Source: Momentum Software Corp.

than half of the company. The money will be used to finance closing costs, future development and sales and marketing efforts, said newly appointed President Larry Duckworth.

Prior to merging, each company operated at break-even revenue for the past two years, Duckworth said. Each started

as a self-financed consulting company and began marketing integration software several years later, accounting for the slow growth.

Although financial details were not available, the merged Momentum has 40 employees and total revenue estimated in the \$3 million to \$5 million range.

The role of message-oriented middleware is to allow applica-

tions to communicate when the networks are different, the hardware is different and the applications were never intended to work together when they were created, said John Mann, a senior analyst at The Yankee Group in Boston.

Specifically, the middleware sits between the applications

and the networks and takes care of translating protocols. On the application side, it gives programmers one development interface. This is different from other types of middleware that are used to develop cross-platform capabilities for a single application.

Support for 20+ systems

The merger is important because messaging middleware typically connects applications running on many different hardware platforms and networks, Mann said.

Together, the two companies said they support 22 desktop and network operating systems and 30 hardware platforms.

Overall, there are roughly a dozen players in the message-oriented middleware market, including Digital Equipment

Corp., IBM, Covia Technologies, PeerLogic, Inc. and TRW, Inc. Like Momentum, most efforts are small-scale because the market is in its infancy, but Digital may be the strongest entity now, according to Mann.

"It's complicated because you don't just need the middleware, you need the integration skill."

—John Mann,
The Yankee Group

"It's complicated because you don't just need the middleware, you need the integration skill," he said.

Although this merger made sense because the two companies' goals meshed so well, alliances between smaller players and bigger company buy-outs are more

likely in the future because of the variety of expertise and skills needed, Mann added.

Company officials said Horizon's Express software and Momentum's X-IPC software will be fully merged by mid-1994.

Select calendar third-quarter results

COMPANY	REVENUE JUNE THROUGH SEPTEMBER	PERCENT CHANGE FROM 1992	NET INCOME JUNE THROUGH SEPTEMBER	PERCENT CHANGE FROM 1992
Bachman Information Systems, Inc.	\$7.7M	NM*	\$(1.8M)	NM*
Borland International, Inc.	\$107.4M	(16%)	\$2.8M	(48%)
Compaq Computer Corp.	\$1.75B	64%	\$107M	118%
Computer Associates International, Inc.	\$516M	20%	\$88M	86%
Corporate Software, Inc.	\$84.7M	13%	\$1.2M	4.5%
Digital Equipment Corp.**	\$3B	(10%)	\$(83.1M)	NM*
EMC Corp.**	\$216M	109%	\$38M	424%
Gupta Corp.	\$13.6M	64%	\$1.1M	146%
KnowledgeWare, Inc.	\$34M	14%	\$1.6M	101%
Madge N.V.	\$30M	84%	\$6.9M	165%
Microsoft Corp.	\$983M	20%	\$239M	14%
NetFrame Systems, Inc.	\$17M	69%	\$2.2M	106%
Network Equipment Technologies	\$55M	1.9%	\$1.5M	(6.7%)
Parallax Computer, Inc.	\$4.6M	31%	\$1.6M	78%
PeopleSoft, Inc.	\$14.9M	83%	\$2.2M	84%
Platinum Software Corp.	\$15.6M	160%	\$1.5M	470%
Powersoft Corp.	\$12.6M	106%	\$2.3M	209%
Sybase, Inc.	\$112.5M	67%	\$11M	88%
Unisys Corp.	\$1.8B	(13%)	\$84.1M	23%
Zeos International Ltd.**	\$56M	10%	\$(2.3M)	NM*

*Not meaningful

**Quarter ended October 2

Sometimes for better, sometimes for worse, weak European sales, downsizing and desktop price wars are shaping quarterly returns.

Leading the way in the PC sector, if not the computer industry, was **Compaq Computer Corp.**, which more than doubled its third-quarter revenue over last year, posting a 64% rise in sales (see story page 1). The company cited unexpectedly strong overseas sales (up 37%).

The European market was less kind to **Digital Equipment Corp.**, which reported a slightly higher than expected loss and a sharp decline in revenue, including its first drop in its services sector, for its first fiscal quarter. PC and Alpha-based sales were bright spots. An edgy Wall Street will be watching the firm closely.

Big iron software sales growth buoyed revenue at **Computer Associates International, Inc.**, which reported an 86% increase in net income and a 20% increase in revenue for its second quarter. CA's midrange product sales leaped 115% year-to-year, while its mainframe revenue, which represented 81% of total revenue, surged 20% for the period. The company cited customer acceptance of its 18-month-old flexible licensing agreements and its services team concept.

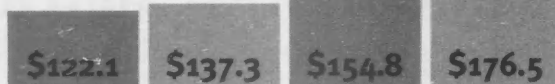
Despite its eighth consecutive profitable quarter, which saw a 23% increase in net income over the same quarter a year ago, **Unisys Corp.** revenue dropped 13%, tripping in part over a decline in the firm's client/server business.

The **Microsoft Corp.** juggernaut rolled on, albeit at a slightly slower pace. The company's fiscal first-quarter revenue growth dipped to a still-healthy 20% from its usual 25% to 50%-plus. Maturity and increased pressure from competitors are taking their toll. Microsoft, like CA, could be starting to feel the sting of the recent PC software price war. CA's micro revenue dipped 3% to 5% for the quarter. A struggling **Borland International, Inc.** suffered from a double whammy caused by the late release of dBase IV for Windows and stalled sales of its Quattro Pro spreadsheet last quarter, pending a new release. It reported a 16% drop in revenue for its second quarter. A \$2.8 million net marked the company's third consecutive profit following a massive loss in its third quarter a year ago.

INDUSTRY PULSE: Service industry

WORLDWIDE SERVICE REVENUE (IN BILLIONS)

*Projected



(Includes: Hardware maintenance, information technology professional services, software support, education and training, parts)

SERVICE MIX (PERCENT OF TOTAL WORLDWIDE SERVICE REVENUE)

HARDWARE MAINTENANCE	48%	46%	45%	43%
IT PROFESSIONAL SERVICES	35%	37%	39%	41%
SOFTWARE SUPPORT	12%	12%	11%	11%
OTHER	5%	5%	5%	5%
Projected	1992	1993	1994*	1995*

SKILL MIX

Percent of present and expected future skill mix, based on surveys with 38 service companies

Hardware maintenance	59%	40%
Software support	15%	21%
Network support	8%	12%
Professional services	7%	15%
Education and training	6%	7%
Other	5%	5%
Projected	1992	1996

TOP 10 SERVICE PROVIDERS

By 1992 worldwide service revenue (in billions)

IBM	\$14.1
Digital	\$5.6
Fujitsu	\$5.1
Xerox	\$4.6
Hewlett-Packard	\$3.0
AT&T/Unisys	\$2.8
Groupe Bull	\$2.7
Siemens/Nixdorf	\$2.0
Ing. C. Olivetti	\$1.5
Eastman Kodak	\$1.3

Source: Dataquest, Inc., Customer Service Trends

The 5th Wave by Rich Tennant



"YES, I THINK IT'S AN ERROR MESSAGE."

Inside Lines

OS/2 "lite" looks late

IBM's promised delivery by year's end of a version of OS/2 2.x that runs comfortably in 4M bytes is looking doubtful. According to sources close to IBM's Personal Software Products Group, the company "will have to invent some things" in order to produce such a product. The company continues to improve the product's speed and performance, but users should not hold their breath waiting for any 32-bit multitasking, graphical operating system in 4M bytes.

Not quite off the vaporware list...

Lotus was expected to officially unveil a long-discussed Windows version of CC-Mail Remote this week but will hold back in order to eradicate some last-minute bugs. The product, originally announced about this time last year, will include wireless drivers for RAM Mobile Data's wireless network. Beta software featured icons for location profiles, communications that run in the background, fields for message summaries and filtering.

... vs. deep in the mist

Meanwhile, Bill Gates rattled his saber at Lotus last week saying that by the third quarter next year, Microsoft will have a "major advance in electronic mail that will bring the benefits of Notes and our Mail software into a single product that will be priced like a mail package." That product is Microsoft's Enterprise Messaging Server, a Windows NT-based database that will provide an object store on top of a relational database engine and a companion Windows NT client. At the same time, Microsoft is pursuing a separate Capone project based on a Windows file-sharing server, Messaging Application Programming Interface and free clients wrapped into the upcoming 32-bit version of Windows known as Chicago [CW, Sept. 6].


New breed

Tools designed from the ground up to target the hassles of distributed client/server development will hit the market shortly. This week, Forte Software in Oakland, Calif., will unveil tools to support partitioning of applications across multiple clients and multiple servers, along with other capabilities. Forte's tools won't ship until mid-summer 1994, however. Dynasty Technologies in Naperville, Ill., meanwhile, is expected to announce and ship tools with comparable features in December.

From the gallows humor department

At what may have been the swan song gathering of Wang's user group in Boston last week, a demonstration of the company's Pace development tools included a database query of "New Jersey customers" that turned up the name of none other than Rick Miller, Wang's former head honcho and now CFO at AT&T. Don Casey, chief development officer at Wang, noted with a tinge of sarcasm that Miller's file mentioned "something about a dime for a phone call." Meanwhile, Matt Konopka, MIS manager at Ellis Coffee Co. in Philadelphia and a member of the U.S. Society of Wang Users board, said that the organization would wait six months before deciding if it would hold another annual meeting. Only 189 attendees registered for Technetron '93, down from about 600 two years ago and thousands in Wang's heyday.

In its upcoming DOS 7.0 (see story page 4), Novell has included a 16-bit networkable game called Net Wars. The three-dimensional, multiuser game allows users to play a shoot-'em-up video game across a network in real time. Company officials said they included the game to demonstrate the sort of advanced networking capabilities its DOS-based users get with the new package. And just so that the game won't tie up networks or cut down on user productivity, information systems managers from a central location can lock out users from playing it. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 765372413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.



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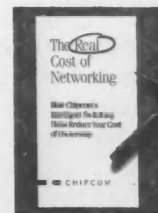
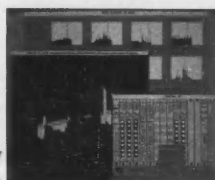
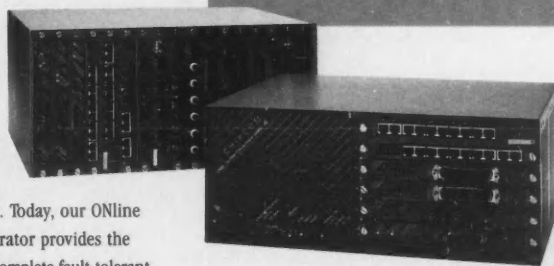
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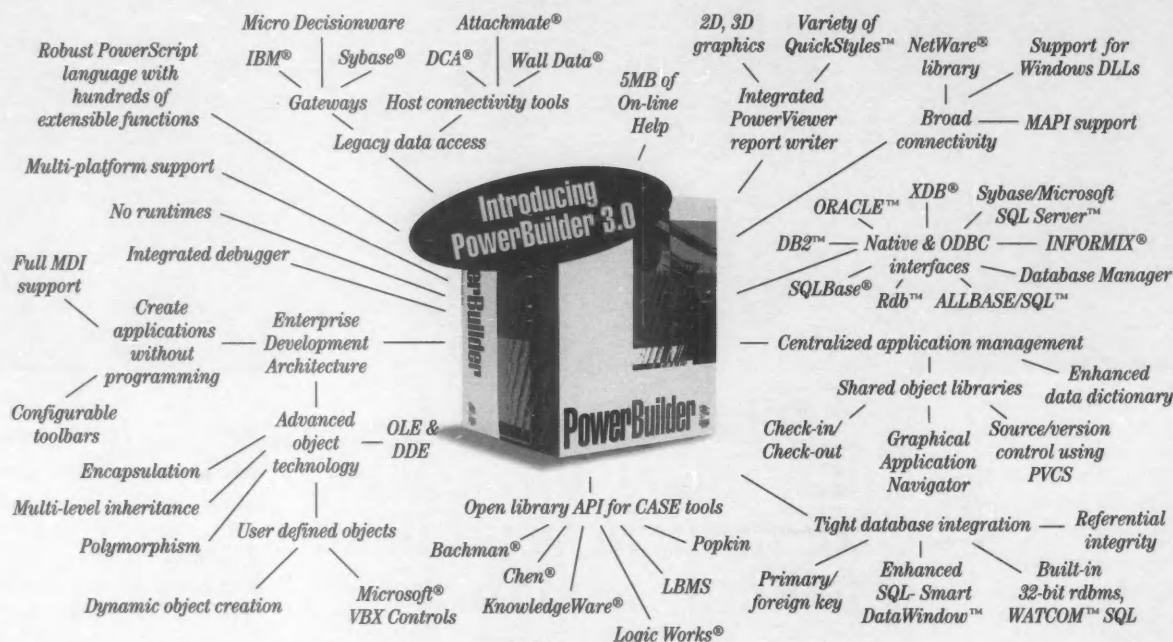
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